FACTORS PRINCIPALS CONSIDER WHEN CHOOSING PROFESSIONAL DEVELOPMENT FOR TEACHERS

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Professional development is supposed to increase instructional capacity in teachers. It is well funded by the Elementary and Secondary Education Act, which also provides clear expectations for activities and programs that research suggests make it effective in improving student learning (Ball & Cohen, 1999; Banilower et al., 2006; Gersten et al., 2014; Guskey, 2000; Loveless, 2014; Yoon et al., 2007). These guidelines are not commonly in practice (National Center for Education Statistics, 2012; Wei et al., 2009).

Of all the actors in all the layers of the school system, principals are ideally situated to facilitate professional development that improves student learning (Hallinger & Heck, 1996; Holland, 2009; Honig & Venkateswaran, 2012; Leithwood & Louis, 2011; Sabina, 2014; Sullivan & Glanz, 2013). If principals know what research says about effective professional development for teachers, they may be better equipped to implement professional development designs that enhance student learning.

This study explored the factors principals in a county in southwestern Pennsylvania take into account when choosing professional development programs for teachers. Through a survey and series of interviews, principals described their consideration of the best practices suggested

by empirical research, teacher agency, adult learning theory and the limiters they face when making decisions.

The study concluded that principals value engaging activities for teachers, but not the power of teacher agency in their own learning. By making decisions with teachers about the teachers' growth, principals may help balance the tension between school and district goals and the goals of their teachers as professionals.

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PREFACE

This paper would not have been possible without the intellectual challenge and support of my professors at the University of Pittsburgh. Thank you, Dr. Trovato, Dr. McClure, Dr. Gunzenhauser, Dr. Bickel and Dr. Garman for challenging my thinking and encouraging my spirit. Dr. Trovato, life has been a happy adventure since our meeting at the Coffee Tree Roasters, thanks in part to you and your colleagues. I am grateful.

My family and friends, you tolerated any number of impassioned phone calls about esoteric arguments, let me poke my head into parties and say hello, and sent me happy texts when I could not make time to talk. Karen, I look forward to reading your preface soon. Few have the fortune of having a twin sister who has earned the admiration and respect of so many. Wendy, your patience and unrelenting encouragement gave me the time and strength I needed to finish this study while leading my school. You are a light. All of you helped me learn and share this work, and I thank you.

1.0 INTRODUCTION

Professional development is supposed to increase instructional capacity in teachers, and administrators in the U.S. ubiquitously use it (Ball & Cohen, 1999; Banilower et al., 2006; Guskey, 2000). The federal government supports it, providing substantial funding in the No Child Left Behind Act of 2001 signed into law in 2002 (No Child Left Behind [NCLB], 2003). According to the Brookings Institute No Child Left Behind (NCLB) allotted about $2.3 billion in 2014 for professional development (Loveless, 2014), a number which represents only a fraction of funds districts spent (Odden, Archibald, Fermanich, & Gallagher, 2002). NCLB also mandates programs that are "high quality, sustained, intensive, and classroom-focused in order to have a positive and lasting impact on classroom instruction and the teacher's performance in the classroom and are not 1-day or short-term workshops or conferences" (NCLB: Professional Development, 2003, § 6301). These guidelines reflect a small, emergent body of empirical evidence suggesting characteristics of professional development programs that have positively affected student learning (Gersten, Taylor, Keys, Rolfhus & Newman-Gonchar, 2014; Yoon, Lee, Scarloss, & Shapley, 2007). Unfortunately, tying improvements in student learning directly to professional development remains elusive, and districts continue to implement one-day workshops and passive programs unsupported by this research (Birman, Le Floch, Klekotka, Ludwig, Taylor, Walters, & … Department of Education, 2007; Blank, de las Alas, & Smith, 2008; Desimone, 2009; Garet, Porter, Desimone, Birman, & Yoon, 2001; Guskey, 2002; Metropolitan Life Insurance & Harris Interactive, 2013; Odden et al., 2002; Wei, Darling-

Hammond, & Adamson, 2010; Wei, Darling-Hammond, Andree, Richardson, & Orphanos, 2009).

If the evidence linking professional development to student learning gives an accurate sketch of effective program design, and if it is funded and mandated by funded by the federal government, why is professional development not clearly affecting student learning? It may be that the evidence linking professional development to student learning is relatively new and is not widely understood. As recently as 2007, Yoon and his colleagues published an extensive review of professional development studies. They found that only nine of the 1,334 evaluations they researched met the What Works Clearinghouse (WWC) standard for quality empirical research (Yoon et al., 2007). Those standards include using control groups in random control trials, longitudinal or comparative designs in quasi-experimental studies (United States Department of Education, 2014). Other studies soon followed Yoon's findings, and researchers and policy makers are beginning to agree on the characteristics of effective professional development repeatedly supported in this literature (He, Rohr, Miller, Levin, & Mercier, 2010; Jaquith, Mindlich, Wei, & Darling-Hammond, 2010; Learning Forward, 2015; Odden, 2010; Sample McMeeking, Orsi, & Cobb, 2012; Saunders, Goldenberg, & Gallimore, 2009). In less than ten years, this research has entered the rhetoric around professional development and found its way into NCLB, yet most teachers are still participating in one-day workshops (National Center for Education Statistics, 2012; Wei et al., 2009).

David Labaree (2010) sees this pattern in school reform stemming from resistance between layers of bureaucracy. Drawing on ideas from David Tyack and Larry Cuban (1995), Labaree suggests reform efforts fail because they do not travel through four levels inherent in school structure, the *rhetorical level*, the *formal structure*, *teacher practice* and *student learning*. Currently, much of the research about how to design and implement effective professional

development remains lodged in the realm of policy makers, educational leaders and professors, though a few ideas have seeped into the layer of formal structure. Teacher collaboration, for example, morphed into the valued concept of the professional learning community (PLC). State policies, educational organizations and curricular programs have adopted the PLC as a favored tool to improve instruction (Birman et al., 2007; Editorial Projects in Education Research Center, 2011; Wei et al., 2009; Wei et al., 2010). Another trend draws from ideas of differentiation and teacher voice, allowing teachers to choose from a menu of program options. Professional learning communities and menu-driven programs, however, do not necessarily affect *teaching practice*. Without influencing the teacher's instruction, the crucial level of *student learning* remains unmoved (Gersten, Taylor, Keys, Rolfhus & Newman-Gonchar, 2013).

Of all the actors in all the layers of the school system, teachers have the most influence over student learning (Chetty, Friedman, & Rockook, 2011; Hallinger & Heck, 1996). Their resistance to change, willingness to accept new initiatives, or purposeful response to mandates decide the success of the reform initiative and of their students (Gunzenhauser, 2012; Labaree, 2010). Principals have the second strongest influence (Hallinger & Heck, 1996; Leithwood, Lewis, Anderson, Wahlstrom, Minnesota Univ., M.I., & Ontario Inst. for Studies in Education, 2004; Leithwood & Lewis, 2011). The principal can stand in the gap between formal structures and teacher practice, helping teachers find ways to manage new initiatives while remaining focused on instruction (Honig & Venkateswaran, 2012). Among the many tasks of school principals, most make decisions about what kinds of professional development their teachers will experience, including their own perception of teacher needs (and in some cases, their perception of teacher voice) (Holland, 2009; Honig & Venkateswaran, 2012; Jaquith et al., 2010; Sabina, 2014). If principals know what the research says about effective professional development for teachers, they may better be able to bridge the layers of *formal structure* and *teacher practice* by

working with their teachers to implement professional development designs that will enhance student learning.

This chapter lays the theoretical and empirical foundation for a dissertation study. It explores what research says makes professional development effective for improving student learning; what activities are common in formal professional development experiences today and what challenges principals face when selecting quality professional development for teachers.

1.1 CONCEPTUAL FRAMEWORK

The principal's perspective orbits around three concepts within the field of administration and policy studies in education: the role of the principal in professional development; the role of professional development for teachers; and the measurement of student learning.

1.1.1 Role of the principal in professional development

The principal is the quintessential middle manager. Accountable to district and state actors and responsible for teachers and students, the principal bears unique pressure from above and below (Metropolitan Life Insurance, C., & Harris Interactive, 2013; National Center for Education Statistics, 2012; Sabina, 2014). Fortunately, this also makes the principal's decisions about teacher learning inimitably suited to help good policy and good pedagogy move through the barrier of the classroom doors.

Studies on school leadership yield a helpful framework for understanding how the principal's actions affect teacher growth. Heifetz (1994) discusses leadership as a series of actions. A leader orients the group, provides order and protection, and helps the group find

necessary resources. Though Heifetz described these responsibilities for leadership in general, similar concepts emerge in school leadership frameworks (Hallinger & Heck, 1996; Leithwood, 1996). In their review of more than 100 studies of principals, Waters, Marzano and McNulty (2003) isolate 21 responsibilities that they find positively correlated with student learning. Among specific actions, their research showed that effective principals collaborate with teachers to "protect teachers from issues and influences that would detract from their teaching time or focus" (p. 4). These frameworks reflect the forces that make up the principal's world: while keeping focused on state mandates and district initiatives, the principal is also intimately involved with the front-lines of teaching and learning, making sure that the direction, structures and resources of the school support that core mission. In professional development, this leadership is key.

Principals make two kinds of decisions that directly influence teacher growth: decisions about formal development opportunities for teachers and decisions about informal ones.

1.1.2 Principal decisions about formal professional development for teachers

Formal professional development includes programs, workshops, conferences, university coursework and other traditional opportunities for teachers to learn from experts in their craft. Teachers across the United States report regular participation in these activities (Birman et al., 2007). In some states, teacher voice plays an important role in making decisions about formal development, while in others the district leaders and principals make choices for teachers based on perceived need (Jaquith et al., 2010; Wei et al., 2009; Wei et al., 2010). Current research in professional development provides limited information about who makes final decisions about

programs, though the research does suggest that principals still play that role more often than other actors (Honig & Venkateswaran, 2012; Jaquith et al., 2010).

Principals' understanding of the empirical body of evidence suggesting what can make professional development effective is another unexplored avenue in current research. The MetLife survey and the National Center for Educational Statistics' School and Staffing Survey (2012) ask a limited number of questions about development in the principals' schools, but not ask factors the principal considered in choosing professional development programs (Garet, et al., 2010; Metropolitan Life Insurance & Harris Interactive, 2013). Since NCLB stipulates that districts and schools should use research-based professional development, and most teachers are still reporting non research-based activities (Birman, et al., 2010; Wei, et al., 2009), I wonder whether principals are unable to implement effective programs or are unaware of what makes programs effective according to this literature.

Another factor affecting principals' decisions for professional development is their perspective on adult learning. Principals who are aware of their own ideas about how adults learn are able to make decisions that intentionally reflect those beliefs, and will better support teacher learning. In his work on professionalism in schools, Gunzenhauser (2012) suggests that making beliefs explicit fosters agency and ethical behavior among educators, allowing them to focus on students and their learning instead of on test scores and accountability requirements. Gunzenhauser's thoughts align with Waters, Marzano and McNulty (2003) and Heifetz (1994), suggesting that a leader's duty is to protect teachers from issues that could distract them from their core mission—ensuring student learning. Sullivan and Glanz (2013) suggest that the principal's role is to facilitate and ensure growth for every teacher. The principal who understands how adults learn can make sure that professional development programs will nurture teacher growth and not become another box for them to check.

Sullivan and Glanz (2013) suggest that professional growth should not only lead to better instruction and deeper student learning, but should also help the teacher take more responsibility for her own craft. They outline a framework that considers teacher agency in supervision of teacher growth, and recommend the supervisor use three tiers of supervision: guided, collaborative, or self-directed supervision. The goal is to help teachers rely less on an evaluator to hold them accountable for growth and gradually take professional responsibility for themselves as teachers. Merriam and Bierema (2014) also explain that the principles of adult learning theory focus on the personal agency of the learner. Effective development programs allow adults to understand, direct, and make use of their learning. Knowles, Swanson and Holton (2011) suggest that, "all normal adults are motivated to keep growing and developing, but this motivation is frequently blocked by…programs that violate principals of adult learning" (p. 67). Current research on principals' decisions about professional development programs offers limited information about principals' beliefs or understanding about how their teachers learn, leaving another avenue open for research.

1.1.3 Principal decisions about informal professional development for teachers

Informal professional development includes job-embedded opportunities for learning—teacher collaboration, action research, mentoring, coaching and other collaborative professional development opportunities. Almost all teachers in the United States report some kind of collaborative activity in their schools, but only a small percentage report that this informal professional development helps them grow as teachers (Birman, et al., 2010; Garet, et al., 2010, Wei, et al., 2009). Principals' understanding of and decisions around informal professional

development can foster engaging collaboration among teachers or can inhibit job-embedded learning (Wei, et al., 2009).

The empirical body of evidence about effective professional development highlights several policies that support effective informal initiatives, including creating places, times, structures and reasons for teachers to collaborate and open up their practice to each other (Wei et al., 2009). Unfortunately, "findings suggest that the kind of job-embedded collaborative learning that has been found to be important in promoting instructional improvement and student achievement is not a common feature of professional development across many schools" (Wei et al., 2009, p. 55).

Principals' perspectives on adult learning also affect their decisions about informal professional development for teachers. Job-embedded learning requires a measure of vulnerability not always necessary in formal professional development programs. Principals who know their own beliefs about adult learning, consider their teachers' motivations and needs and make collaborative decisions with teachers (Leithwood, Louis, Anderson, Wahlstrom, Minnesota Univ., & Ontario Inst. for Studies in Education, 2004) may foster engaging informal learning structures and environments.

One area of informal professional development falls beyond the scope of this paper: teacher induction. Districts use induction to orient teachers to the profession and to support teachers in the steep learning curve of their first few years of teaching (Birman et al., 2010; Choy et al., 2006). Induction for beginning teachers has become a priority for districts and states in the last 15 years, with more teachers participating and more funding and time allocated for induction activities (Choy et al., 2006; Cohen & Hill, 2001; Darling-Hammond & McLaughlin, 1995). While this branch of professional development merits study, it is complex in purpose and focused in its population. I have elected not to include induction in considering principals'

decisions for informal professional development. Instead, I will focus on decisions about activities for their veteran teachers.

1.2 ROLE OF PROFESSIONAL DEVELOPMENT FOR TEACHERS

Professional development for teachers that only affects teacher behavior does not matter to the most important layer of our education system. It must affect *student learning*. This happens as teachers take agency over their practice (Greene, 1997; Gunzenhauser, 2010; Knowles et al., 2011; Merriam & Bierema, 2014; Sullivan & Glanz, 2012). Before Yoon and his colleagues (2007) wrote their report, Mary Kennedy (1998) conducted a similar meta-analysis of professional development studies with a new perspective: instead of measuring effectiveness according to teacher perception or change in practice, she looked at student learning as her key metric.

Kennedy (1998) found that researchers approached the question of how professional development affected student learning in several distinct ways. Some researchers taught teachers prescribed pedagogical routines and then looked for effects in student learning. These studies generally used standardized test scores as their assessment. They found that training teachers to recreate an effective pedagogical behavior with fidelity had a small positive effect on students' basic skills and knowledge.

Other experimental programs taught teachers deeper knowledge of the subject area they taught, and then trained teachers in prescribed behaviors for the classroom. Researchers tested teachers' knowledge and changes in students' standardized scores. They found that enhancing

teacher understanding of the content along with specific pedagogical techniques improved student learning outcomes in skills and knowledge as well.

A third variation in professional development design produced markedly different results. This design also focused on the content the teachers taught and typical ways children learned it, but instead of asking teachers to follow prescribed behaviors, the researchers asked teachers to think about the content, the way children typically approach it, and create their own teaching strategies. Kennedy describes a 1989 study by Carpenter, Fennema, Peterson, Chiang, and Loef who created a program based on an analysis of children's early mathematics learning. (Yoon and his colleagues also consider the Carpenter study in their 2007 report). Kennedy (1998) explains that:

> Teachers were not provided with a set of invariant teaching strategies, but the researchers encouraged teachers to think about instructional implications of these findings, and they engaged teachers in discussions about different ways of teaching different types of problems to children. (p. 17)

In addition to measuring changes in teacher knowledge and standardized test scores of children, researchers also evaluated students' ability to reason and solve problems. This approach produced the strongest effect across all measures: teacher learning, students' skills and knowledge and students' reasoning and problem solving ability.

The difference between the first two professional development designs and the last design was a difference in agency. In the first design, teachers learned how they should behave. In the second, teachers learned what they should know and how they should behave. The third design asked teachers to make their own decisions about how they should behave based on what they should know about the content. This shift from passive learning to active working shifted agency to the teachers. Actively choosing how to teach based on content and how students learn asks

teachers to think, speak and act as professionals; it asks them to take responsibility for that freedom and use it to improve their practice (Garman, 2006; Greene, 1997; Gunzenhauser, 2012).

The powerful effect of giving teachers agency over their own learning aligns with two thoughts about professional development. Ethically, approaching teachers as partners in their learning and their pedagogy treats them as mutually accountable professionals. This professionalism may be necessary for teachers to excel and foster deep student learning (Garman, 2006; Greene, 1997; Gunzenhauser, 2012; Strike, 2010). It may allow them to imagine possibilities for instruction and student learning that do not currently exist and intentionally grow their practice (Greene, 1997). Another parallel concept in professional development suggests that the teacher's experience, ideas and motivation are essential to her learning. Adult learning theory (Knowles, Swanson & Holton, 2011; Merriam & Bierema, 2014) supports the findings of the Kennedy study (1989), which allowed teachers to decide how to use what they had gained from their professional development in the best interest of their students' learning. These two concepts, teacher agency and adult learning theory, describe two ideas in education that lead to increased student learning in Kennedy's (1998) meta analysis. Later research continues to pursue the question of what makes professional development for teachers positively affect student learning, which is the goal: professional development should help teachers grow, and it should show in student learning.

1.3 STUDENT LEARNING AS A MEASURE OF PROFESSIONAL DEVELOPMENT EFFECTIVENESS

Professional development centers on Labaree's (2010) third level of school system bureaucracy, *teacher practice*. Before 1990, most research evaluating the effectiveness of professional development programs focused on this level, considering changes in teacher knowledge, self-reported practice, and attitude about the professional development experience and its effect (Kennedy, 1998). Evaluators assumed that programs that improved *teacher practice* would naturally improve *student learning*, and few evaluations used a *student learning* metric to suggest the effectiveness of a professional development program. Educational researchers began questioning the validity of solely using teacher learning as a measure of professional development effectiveness, though, and began asking how the programs affected students (Desimone, et al. 2002; Garet, Porter, Desimone, Birman & Yoon, 2001; Guskey, 2002; Kennedy, 1998). As administrative policy began to shift toward the "scientific-based" practice codified in No Child Left Behind (2002), evaluators began to consider two measurements of *student learning* to support professional development programs: measurements of basic skills and knowledge and measurements of students' reasoning and problem solving.

Measuring basic skills and objective responses reveals one clear slice of a child's academic growth. The proliferation of new standardized tests since NCLB (2002) has provided a variety of possible tools for measuring changes in basic skills. Professional development evaluations have increasingly incorporated these state and national assessments to measure student growth, especially in mathematics (Garet et al., 2010; Gersten et al., 2014). Examples include the Colorado Student Assessment Program (Sample McMeeking, Orsi & Cobb, 2012) the Iowa Test of Basic Skills in computation and problem solving (Carpenter, Fennema,

Peterson, Chiang & Loef, 1989) and the Northwest Evaluation Association total score assessment (Garet, et al., 2010). The benefit of standardized tests is that their closed-ended, algorithmic questions are simpler to draft, track, score and compare, making evaluations of changes in student learning easier to recognize. The drawback is that they often only measure a narrow layer of complex learning, shallowly assessing reasoning skills, synthesis of information, evaluative skills and novel problem solving abilities.

Many evaluators argue for an assessment of reasoning as well as a measure of basic knowledge (Desimone, 2009; Guskey, 2012) and many evaluations of professional development incorporate both (Garet et al., 2010; Kennedy, 1989; Yoon, 2007). Arguably, these skills are as central to student learning as understanding basic information, but creating a standardized test for them is difficult. In their recent implementations of Common Core assessment, the Partnership for Assessment of Readiness for College and Careers (2015) and the Smarter Balance Consortium (2012) offer some computer adaptive iterations of standardized assessments that allow students to demonstrate wider ranges of reasoning skills. The assessments offer more depth, but they are unable to create opportunities for completely open-ended answers from students within the examination. The challenge forces evaluators of professional development to weigh the ability of an assessment to measure students' reasoning skills with the ability to standardize its results and compare them with other students completing the same assessment. Evaluators of professional development programs have approached this in a variety of ways, describing their own tools for assessing reasoning (Perry & Lewis, 2011), adapting state assessments to measure changes in reasoning skills (Carpenter et al., 1989), or using a baseline of student responses in the classroom to measure changes after the professional development program (Tienken, 2003).

The literature suggesting what makes professional development effective leans on both measures of learning: basic skills and knowledge, and reasoning and problem solving skills.

2.0 EFFECTIVE PROFESSIONAL DEVELOPMENT, CURRENT PRACTICES, AND CHALLENGES TO IMPLEMENTING EFFECTIVE PRACTICES

2.1 WHAT MAKES PROFESSIONAL DEVELOPMENT EFFECTIVE

Mary Kennedy (1998) initiated the dramatic shift in program evaluations by using improvement in student learning as her metric. Yoon and his colleagues continued this trend toward student-learning-based evaluations of professional development in 2007, using the rigorous What Works Clearinghouse (WWC) standards for strong research in education as the benchmark for quality evaluations. The standards call for randomized control groups, internally and externally valid protocols, and specific measures and methods for evaluating quasi-experimental studies (U.S. Department of Education, 2013).

Evaluators continue to use the WWC standards as they create rigorous study designs, attempting to reveal causal connections between evaluations of professional development programs and student learning outcomes. In 2010, for example, Garet and his colleagues dismissed some of the studies Yoon et al. (2007) had previously used as not strong enough to meet the current WWC standards and demonstrate plausible causality. Though the studies had met WWC standards when Yoon's literature review was published, researchers continued to raise the level of evidence required for strong designs and limited the weight they gave to some older studies. Researchers have found a consistent set of practices for effective professional development in this body of research, including the number of contact hours in a professional

development program; the time it spans; the active engagement of the adult learners; the opportunities to collaborate; the focus on academic content and appropriate pedagogy; and the coherence of the program with the goals of the teacher and the school (Birman et al., 2007; Blank et al., 2010; Cohen & Hill, 2001; Garet et al., 2001; NCLB, 2001; Yoon et al., 2007; Wei et al., 2010). Though many studies support the influence of these characteristics in ensuring professional development programs, others challenge the strength of causal connections concerning what makes professional development effective for influencing student learning (Desimone, 2009; Garet et al., 2010).

This section outlines aspects of professional development that the body of empirical evidence suggests make it effective for enhancing student learning. I consider the research through three lenses: empirical research that meets WWC standards, adult learning theory, and the concept of agency in the professional development program. I also consider the views of researchers who remain skeptical about causal relationships between aspects of professional development programs and effects on student learning. I believe that the intersection of these perspectives reveals a strong foundation for what works in moving student learning forward through professional development for teachers.

2.1.1 Contact hours: More than fourteen hours

Professional development programs that positively affect student learning outcomes require many hours of engaged work from teachers. Yoon et al.'s (2007) analysis suggested a minimum of fourteen hours to have a statistically significant positive effect. Gersten and others supported this finding (Gersten et al., 2014; He et al., 2010; Jaquith et al., 2010; Sample McMeeking et al., 2012; Saunders et al., 2009; Wei et al., 2009). Many effective programs in the literature engaged

teachers for more than 30 hours (e.g. McGill-Franzen, Allington, Yokoi, & Brooks, 1999; Perry & Lewis, 2011; Saxe, Gearhart & Nasir, 2001), more than 70 hours (e.g. Carpenter et al., 1989; Cole, 1992; McCutchen et al., 2002), and some more than 100 hours (e.g. Marek & Methven, 1991; Sample McMeeking et al., 2012). Programs that last less than about 14 hours tended to yield little positive change in student learning (Gersten et al., 2014; Sloan, 1993; Yoon et al., 2007).

As adult learners, teachers benefit from this substantial amount of time because it allows them to take in the information, understand why it is useful to their work, begin to apply it and reflect on the outcome. The process moves through four phases: 1) understanding the need for new information; 2) creating strategies to use it; 3) implementing those strategies and 4) evaluating the results. With time to move through these stages—especially to understand the "why"—teachers are able to master the professional development program's learning and make it a part of their practice, affecting student learning (Knowles, Swanson & Holton, 2011; Merriam & Bierema, 2014).

Allowing teachers the time they need to delve deeply into professional development allows them to exercise their agency as professionals. Teachers who already have first hand experience with their students and the ways they learn have the most authentic perspective on using a new instructional strategy. When they have the time to deeply understand the pedagogy, teachers can implement it with nuances necessary to reach different learners. This agency may be key to bringing helpful reform through layers of rhetoric and into the classroom (Gunzenhauser, 2012; Labaree, 2010).

2.1.2 Time span: longer than a semester

The body of empirical research connecting professional development to student learning growth suggests that programs must span a period long enough for teachers to incorporate the learning into their practice and see improvements in student learning outcomes. The research suggests a minimum length of a semester, with some exceptions. Many programs in this research run throughout a school year, and a few examples run even longer. Sample McMeeking et al. (2012) and Tienken (2003), for instance, examined programs that lasted one semester; both programs also involved intensive engagement on the part of the teacher. Sample McMeeking et al. (2012) focused on helping teachers create and share instructional innovations based on how students learned the content. This intensive training happened over a summer course, with four follow up sessions through the fall. Tienken (2003) also researched a semester-long program that had a positive effect on student learning. This program involved one-on-one and small group coaching more than 14 weeks, a program that required intensive teacher engagement. Many programs that had a positive effect on student learning lasted at least one year, for example Saunders et al. (2009), Perry and Lewis, (2011) and Jacobs et al., (2007). Most programs that lasted at least a semester positively affected student learning.

There are several exceptions in the literature. Some programs that showed a positive effect on student learning lasted for only a month-long summer institute with minimal follow up. Marek and Methven (1991) evaluated a program that required teachers to spend four weeks of full-time professional learning over a summer. Teachers in the program learned to consider concepts in science from the students' perspective and then collaborated with each other to create effective instructional strategies, test them and reflect on their use. Though the teachers only received minimal follow up throughout the school year, the collaborative relationships they built

continued into the school year. These ongoing relationships focused on instruction seemed to be enough to have a positive effect on student learning. On the other hand, Garet et al. (2010) studied programs lasting one and two years, and found no positive effect on student learning. These professional development programs focused on teachers' instruction of rational number concepts in math. The professional development addressed teacher understanding of the concepts, explained common effective strategies of instruction and explored common student misconceptions in the area. The authors suggested that high teacher turnover may have been the reason these programs were not effective. Adult learning theory and teacher agency, however, offer another perspective on what made this program ineffective and others effective.

In Marek and Methven's (1991) study, teachers not only learned from a students' perspective, but from a step-by-step release of agency from the facilitator to the teachers. They write,

> repeatedly during the workshop, the participants experienced a teaching procedure, the learning cycle, which actively involved them in three phases…after completing several learning cycles, the teachers then taught each other using learning cycles from the Learning Science Program [Renner, Stafford & Coulter, 1977]. Following this, the teachers developed learning cycles from a variety of science textbooks and workbooks, and these learning cycles were presented to each other as preparation for usage in their own classrooms. (p. 43)

Garet and colleagues (2010) describe a program involving more facilitator and less teacher agency. They describe that,

> for the summer institutes and seminars, the planned PD activities included opportunities for teachers to solve mathematics problems individually and in groups, make short oral presentations to explain how they solved problems,

> receive feedback on how they solved and presented their solutions, engage in discussions about the most common student misconceptions associated with topics in rational numbers, and plan lessons that they would teach during the follow-up coaching visits. The coaching visits…employed both individual and group activities and were designed to help the teachers apply material covered in the institutes and seminars to their classroom instruction. (p. xviii)

Teachers in the Garet study were actively engaged in what they were assigned, even in the follow-up coaching throughout the year.

Though the first professional development program only lasted a month, it paralleled adult learning theory and required teachers to take responsibility for their learning. The teachers themselves experienced the "learning cycle method" and taught pre-designed lessons from this method (phase one of adult learning theory—seeing the need); created their own lessons (phase two—creating a response); taught the lessons (phase three of adult learning theory—implementation); and evaluated them (phase four—evaluation). They continued designing lessons, teaching and reflecting on them throughout the school year. This agency allowed them to take professional responsibility for their own growth (Gunzenhauser, 2010). During the second program's two years, it did not release the responsibility for learning to the teachers in a cohesive, accountable way. It did not foster teacher agency or relate to adult learning theory. Student learning showed no effect from these programs. Two years of passive learning did not match four weeks of active engagement, suggesting that the amount of time spent in professional development is as important as the agency and responsibility of the teachers for their own learning.

2.1.3 Engagement: Active on the part of teachers

The body of professional development evaluations suggests that teachers must be actively engaged in the professional learning program to cause any change in student learning. Active programs require teachers to employ their own agency as they learn, e.g. to create their own lessons, discuss opposing viewpoints and evaluate other's work. Passive programs where teachers receive lessons instead of create their learning have yielded modest results at best (Porter et al., 2000).

In Yoon et al.'s (2007) seminal review of professional development literature, two studies demonstrate the effects of passive professional development on student learning. Teachers watched videos, heard scripted direct instruction, carried out role-play exercises and completed exercises in workbooks in Cole's 1992 review of a professional development program in Mississippi. The state implemented the program to help teachers develop 14 fundamental skills measured by the Mississippi Teacher Assessment Instrument, including planning, organization, communication and the use of data in designing instruction. Though the schools presented the program systematically with fidelity, it yielded very limited improvement on students' learning (Yoon et al., 2007). Cole describes the program as highly scripted. The program dictated the direction and goal for all teachers' learning based on its review of effective teaching research. The author writes, "As a guide for planning staff development programs, Dillon-Peterson (1986) cautioned that, 'Opportunities for growth need to be appropriate for the kind of teachers we want, (p. 33)'," (p. 13). For this study, the program dictated "what kind of teachers" it set out to create. The results of the program showed minimal improvement for some students' learning, but did not have a powerful effect and did not reach all students (Cole, 1992; Yoon et al., 2007). This program may have failed to nurture effective teaching behaviors in the classroom because it

failed to yield adults the professional agency they needed to grow (Gunzenhauser, 2010; Knowles, et al., 2011; Merriam & Bierema, 2014).

Another study yielded similar results. Duffy et al.'s 1986 evaluation of a professional development program on teaching reading strategies also was implemented with fidelity, but showed little impact on student learning. The program gave teachers direct instruction on five explicitly stated reading strategies, and presented teachers a five-step lesson plan template to help them give lessons. This direct instruction was not enough for teachers to take the learning and bring it into their classroom. The authors report:

> (T)eacher interviews conducted at the end of the study revealed that several treatment teachers did not consistently use explicit explanations in their routine skill teaching because they found it difficult to develop and implement such explanations. They had difficulty (a) committing themselves to teaching skills as strategies rather than as memorized procedures, (b) doing the pre-active task analysis needed to describe to students the thinking associated with strategies, and (c) altering instructional routines provided in practice exercises and workbooks. Because of these obstacles, several treatment teachers reported that they used explanations only on the days they were observed. As a result, students may have had little opportunity to build an understanding of how to apply skills consistently over time, despite their improved awareness following each of four observed lessons. (p. 247-248)

Following the principals of adult learning could have provided teachers time to see the need for explicit instruction, create strategies for incorporating it, given them practice in implementing it and allowed them to assess its success, instead of hearing about it, talking about it and following a lesson plan format created by the program experts.

Professional learning programs that actively engage teachers often result in improved student learning. In Carpenter et al.'s 1989 study, teachers received direct instruction on children's cognition in mathematical concepts. The program then asked teachers to engage in discussion about how children's learning could affect their instruction. It gave time for teachers to explore curricular materials and collaboratively create strategies for instruction using those tools. The program relied on teacher engagement and released responsibility for learning to them after initial direct instruction on student learning. As a result, students made modest gains in computation and problem solving. Teachers experienced lessons as their own students would experience them in Marek and Methven's (1991) study on science instruction based on the learning cycle method. They discussed their learning as students, created lessons collaboratively, and saw statistically significant improvements in students' understanding of scientific concepts. McCutchen et al.'s (2002) evaluation of professional development found that students gained in reading skills when teachers engaged in a similar program. Teachers in this study also experienced a lesson as students, then created their own instruction, taught each other, and evaluated their new strategies collaboratively. Tienken's (2003) professional development evaluation found that one-on-one mentoring of and collaboration with teachers on writing instruction also led to gains in student achievement in writing. Other successful programs in professional development evaluation literature involve limited direct instruction from experts; present teachers problems of student learning, materials, and time for supported collaboration, and ask teachers to create instructional strategies and lesson plans (e.g. Garet et al., 2010; Perry & Lewis, 2011; Sample McMeeking et al., 2012; Saunders et al., 2009).

Passive instruction in professional development programs tends to result in minimal changes in teacher practice and student learning. Engaging teachers by giving them agency over their learning tends to result in changes if the teachers understand the need for growth and have

tools and supports to create, implement and evaluate new strategies for instruction. Experts who facilitate engaging professional development release responsibility of learning to the teachers who are then able to improve instruction and see improved student learning.

2.1.4 Collaboration: Focused on instruction and pedagogy

The body of empirical research on professional development suggests that programs fostering focused collaboration among teachers tend to result in increased student learning (Desimone, et al., 2002; Porter et al. 2000). Programs that allowed for no collaboration tended to result in no change of student learning. Sloan's (1993) evaluation of a professional development program teaching questioning techniques, for example, facilitated no collaboration between teachers. Instead, teachers received training in a questioning technique, handouts and watched a video. They did complete a quiz and a survey following the session to inform the next training. There was no effect on student learning between the experimental group and the control group. Sloan notes that similar programs included opportunities for teachers to observe each other and give feedback about what they observed in the classroom. He suggests that even feedback from the researchers would have helped, but I contend that his first idea was the more helpful. Cole (1992) and Duffy (1986) both evaluated studies that did give teachers feedback, but the information came from supervisors and researchers. It did not cause any notable changes in student learning.

On the other hand, empirical research of professional development programs that did positively effect student learning contain a wealth of programs involving focused teacher collaboration. Carpenter et al. (1989), for instance, evaluated a program where teachers worked together to consider how children's math cognition could inform their instruction and create strategies for that instruction using shared curricular materials. Teachers in Marek and

Methven's (1991) program engaged in rigorous discussions about instruction, creating lessons together, teaching each other and critiquing each other's work. McCutchen's (2002) professional development program also asked teachers to observe each other's instruction and offer feedback, and created collaborative relationships that teachers continued during the school year. Other effective, collaborative programs were evaluated by Jacobs et al. (2007), Perry and Lewis (2011), Sample McMeeking et al. (2012), Saunders et al. (2009), and Saxe et al., (2001).

Saxe's (2001) study offers a note of caution about collaboration in professional development programs. The study included three experimental conditions: one group experienced the Integrated Math Assessment program, a summer institute with follow up throughout the year. The IMA program focused on teacher understanding of mathematics, student understanding and learning in mathematics and effective pedagogy. Another condition implemented a collaborative group of teachers, a support group, which met nine times during the school year to discuss problems of practice they found relevant. The facilitators offered no guidance, structure or tools other than holding the meeting for the teachers. A third experimental condition did not offer any additional time or support to teachers who wanted to use the traditional textbook. Researchers called this the traditional group. After the year's programs, students whose teachers went through the IMA program outperformed students in the other two condition groups. Between the traditional group and the support group, however, students from traditional group teachers earned higher scores on their standardized math assessment than students from the support group. Collaboration without focus actually brought weaker instruction than traditional methods. This result suggests that the purpose or content of collaboration is at least as important as the collaboration itself, and that it can have a negative effect. When collaboration is focused on content, student learning and instruction, empirical studies of programs suggest it can have a powerful positive effect on student learning.

The link between collaboration in a program and effects on student learning may be that collaboration requires agency from teachers. As they collaborate in professional development, teachers' own input becomes more important to their learning process. It provides an activity in which teachers' understanding becomes the basis for ideas and strategies, and teachers transition from being engaged to being responsible for their own learning. This shift of responsibility is important because adult learners

> resent and resist situations in which they feel others are imposing their wills on them. This presents a serious problem in adult education: the minute adults walk into an activity labeled 'education,' 'training,' or anything synonymous, they harken back to their conditioning in their previous school experience, put on their dunce hats of dependency, fold their arms, sit back, and say "teach me." (Knowles, Swanson & Holton, 2011, p.63)

Empirical research suggests that collaboration is one activity that makes professional development successful in helping teachers learn better ways to help students learn.

2.1.5 Content: Focus on specific content

The focus of any activity in a professional development program for teachers also has a profound affect on how successful the program is in improving student learning (Desimone et al., 2002; Porter et al, 2000). Programs in the literature that focus on a narrow concept or skill tend to have a statistically positive effect. These programs generally aim to develop two areas of understanding and skill in teachers: a deeper understanding of the content the teachers teach and a clearer perspective on the most effective teaching strategies for that subject. Programs that

attempt to develop a broad set of skills do not tend to improve student learning, neither do programs that do not address specific content or the appropriate pedagogy for that content.

One study already mentioned attempted to teach teachers fourteen basic competencies in teaching. This program, evaluated by Cole in 1992, did not teach any academic content, address any teacher understanding of content or any specific pedagogy. It did teach general practices in teaching, including using data to inform instructional plans, communication during instruction and organization. The program had no effect on student learning according to the state standardized test results (though other metrics may have shown growth, the study only used these scores as its measure). Sloan's 1993 review showed no effect in student learning from a program designed to help teachers improve their questioning techniques. The program focused on helping teachers handle correct responses, allow wait time for students and call on students according to anticipated ability level, a focus that did not improve student learning. Another program (Duffy et al., 1986) taught teachers to explicitly teach reading comprehension strategies, but did not improve student reading. The authors reasoned that teaching reading comprehension strategy to teachers did not necessarily help them understand why those strategies could work, nor the pedagogy necessary to help students put it to use. They found that some teachers helped students understand the strategies and when to apply them, while others used an algorithmic approach. The authors write,

> teacher D emphasized memorizing the label *context* and frequently asked, "What is it called?" She also stressed rote memorization of the steps to be used rather than an understanding of how to be strategic when figuring out a word meaning. For instance, the emphasis in the following exchange is on learning the steps, not on understanding how to think through the process of figuring out word meaning

using context…these differences may also have influenced student achievement. (Duffy et al., 1986, p. 248)

The body of empirical research on the content of professional development supports the authors' hypothesis.

Effective professional development programs focus on nurturing teacher understanding of their academic content and developing effective pedagogy to teach it. Carpenter and colleagues (1989) studied a program teaching teachers how children learn specific mathematical concepts. It did not give them any instructional methods—only the math and the way students learned it. Students earned higher scores on standardized tests in math. Perry and Lewis (2011) evaluated the effects of lesson study and a resource kit on fractions. Teachers had to learn concepts behind fractions and collaboratively create lessons to use the fraction kit materials in teaching. They found that teachers' and students' knowledge of fractions grew significantly with the use of a resource kit and of lesson study. Sample McMeeking and colleagues (2012) studied the effect of a professional development program on students' state test math scores. The program included a summer course on content and follow up workshops through the year on pedagogy. Student scores improved. Other studies focusing on content and pedagogy that were effective in enhancing student learning include Jacobs, et al., 2007; Marek and Methven, 1991; McCutchen et al., 2002; Saxe et al, 2001; and Tienken, 2003.

Focusing narrowly on content and pedagogy allows teachers to dive deeply into one area of their work lives and grow. Adult learning theory suggests that the intentional focus can give teachers the freedom they need to explore their own limitations and create new instructional strategies that they can implement in the classroom and evaluate with their new understanding (Merriam & Bierema, 2014). When teachers have the time and support to learn about their

content and its pedagogy, the students benefit. Professional development programs that focus on these two areas tend to improve student learning.

2.1.6 Pedagogy: Teach content from student perspective

Empirical evaluations of professional development studies suggest that programs that teach pedagogy based on a student's perspective tend to promote student learning more than programs that omit learning about student thinking (Desimone, et al., 2002). Some programs approach pedagogy by explicitly teaching teachers how students consider their subject (e.g. Carpenter et al., 1989, McCutchen et al., 2002; Sample McMeeking et al., 2012; Saxe et al., 2001). Others use teacher reflection after implementation to develop understanding in teachers (e.g. Jacobs, et al., 2007; Tienken, 2003). A number of programs teach the content to teachers as if the teachers were students, allowing teachers the direct experience their students will have in the parallel lesson (e.g. Marek & Methven, 1991; Perry & Lewis, 2011). Successfully understanding the student thinking at the heart of effective pedagogy helps teachers employ the strategies deftly. Duffy's (1986) study of teaching teachers to explicitly talk about reading strategies is a prime example. Without understanding the student perspective, some teachers were unable to use the pedagogy to help their students learn.

Understanding student thinking can help a teacher see the need for a particular strategy. It can help the teacher craft similar methods to help children learn, can help the teacher put the pedagogy to use effectively and can give the teacher the information he needs to assess its successfulness. Those four actions: seeing the need, creating a strategy, implementing it and assessing it are the four basic phases of adult learning (Knowles, et al., 2011). Evaluations of

professional development programs suggest that this is a key piece to making those programs effective in promoting student learning.

2.1.7 Coherence: aligned with teacher goals and school goals

Pedagogy, content, collaboration, engaged learning, sufficient contact hours and time span all work together to help professional development programs improve instruction and enhance learning (Porter et al., 2000). Evaluations suggest one final aspect of professional development is crucial to moving it through the layers of rhetoric in the school system into the level of teacher instruction and student learning. Effective professional development must be coherent with the goals and needs of the teacher and with the perspective of the school to improve student-learning outcomes in that system. Coherence with teacher goals ensures that teachers will not resist the professional development and provides intrinsic incentives for learning, consistent with adult learning theory. Coherence with the school's goals ensures that the changes in instruction will help move student learning in the direction the school community has chosen.

Within the body of high-quality empirical studies that examine characteristics of effective professional development, most programs are aligned with a specific learning goal measured by student performance on a specific metric. For example, Tienken (2003) measured the progress student made in organizing their writing by administering a writing task parallel to the Elementary School Proficiency Assessment, a test created by the New Jersey Department of Education. Perry and Lewis (2011) created an assessment of students' knowledge of fractions by arranging questions on already existing established standardized tests. Sample McMeeking (2012) used the Colorado state mathematics test results to evaluate student learning in mathematic thinking. Each of the programs intended to improve student learning in the specific

area their metric evaluated, lining up the program with the goals for student growth and with the assessments that measured it.

On the other side of the issue, programs that positively influence student learning address the knowledge and skills teachers use in their daily work in the classroom (Cohen & Ball, 2001; Garet, 2001). Some programs develop teacher's understanding of content and pedagogy by creating experiences with their content that directly parallel effective teaching strategies (Carpenter, et al., 1989; Marek & Methven, 1991). Others use explicit instruction about children's thinking in the content area to help teachers design effective strategies for instruction (Jacobs, et al., 2007; McCutchen et al., 2002). Other effective programs allowed teachers to work directly with student work or instructional materials as they discussed the specific content and created effective teaching strategies (Perry & Lewis, 2011; Saxe et al., 2001). All of these tactics allow teachers to understand better instruction while engaging in activities that they can directly apply to their classroom work.

Coherence with the teacher's daily work may seem like an obvious component of quality professional development programs, but this connection must be balanced with coherence with the school community's goals for student learning. A teacher of math may resist being told that she must learn to help her students talk about their math or write about it. A teacher of writing may insist on writing over a student's work, though the district is asking her to give feedback in a new way. Adult learning theory suggests that connecting learning to daily life situations helps adults adopt new skills and information—if they understand a need for it. Without understanding the "why," teachers lose the opportunity to exercise their own agency over their learning, and they blindly follow (Duffy et al., 1986) or resist (Gunzenhauser, 2012; Labaree, 2010). Creating professional development programs for teachers that are coherent with the teachers' daily work

and learning community's goals is a daunting prospect, but evaluations of effective programs suggest it is crucial.

2.1.8 Conclusion: Empirical evidence and adult learning theory

Professional development evaluations shifted away from measuring self-reported behavior and teacher perception to measuring student-learning outcomes at the turn of the century (Kennedy, 1998). During that shift, Garet, Porter, Desimone, Birman and Yoon (2001) used a national survey of teachers to parse out what aspects of professional development they found effective to help them change instruction and see a difference in student learning. Their research provided a map of aspects of professional development that influenced or were influenced by each other, and connected that map to reported changes in teaching practice. Aspects included the time span, contact hours, collective participation, coherence, active learning, focus on content knowledge, enhanced knowledge and skill, and finally change in practice (Garet, et al., 2001). Six years later, Yoon, Duncan, Lee, Scarloss, and Shapley published their analysis of the nine professional development programs that met What Works Clearinghouse standards (Yoon, et al., 2007). They found that these empirical evaluations supported much of Garet and his team's findings in 2001, including the amount of engaged hours, the duration, the content and pedagogical focus, and the quality of the delivery—whether the program supported active engaged learning or not.

In the chart below I consolidate the aspects of professional development for teachers that empirical research suggests make it effective for promoting student learning. Again, the studies surveyed all met What Works Clearinghouse standards for high quality research, in an attempt to provide the strongest available evidence for what makes professional development improve student learning, at least in a short-term, measurable way. Even these studies cannot paint a clear

picture of what aspects of professional development programs ensure deep student learning in the long term. They cannot easily measure the growth of the individual as a community member, problem solver, communicator or creative innovator—learning that students arguably need to succeed as adults (Noddings, 2013; Wagner, 2010). Given this limitation, the results of the What Works Clearinghouse approved studies show that intentionally incorporating these aspects of professional development tends to improve student learning results on some measures.

FINDINGS FROM STUDIES MEETING WWC STANDARDS	
ENGAGED HOURS: MINIMUM 14	Programs that offered at least 14 hours of engagement tended to move learning forward. Fewer hours had little effect on student learning.
TIME SPAN: AT LEAST 1 SEMESTER	Programs that last at least a semester tend to correlate with student learning improvement more than shorter programs.
ACTIVE ENGAGEMENT	Programs that engage teachers in active learning tend to promote student learning. Passive programs do not.
COLLABORATION	Programs that foster focused collaboration among teachers tend to strengthen teacher learning and enhance student learning outcomes.
FOCUS ON CONTENT: TEACHER UNDERSTANDING	Programs that focus narrowly on teacher understanding of content tend to enhance student learning of that content.
FOCUS ON PEDAGOGY: HOW STUDENTS LEARN	Programs that teach how students experience and learn specific content tend to promote student learning.
COHERENCE: TEACHER AND SCHOOL	Programs that are coherent with teachers' daily work and with school learning goals for students tend to promote student learning growth.

Table 1. Empirical research chart

Three years after Yoon and his team's 2007 analysis, Garet et al. published a contradictory finding (Garet, et al., 2010). The researchers set out to conduct two evaluations of math professional development programs using Yoon et al.'s findings as a framework. They considered programs developed by America's Choice and Pearson Achievement Solutions aimed

at enhancing student learning in fractions, decimals, percent, ratio and proportion. The programs' time span, engaged hours, content and pedagogy focus, collaboration and cohesion all suggested these programs would move student learning forward, yet they did not. The researchers found a correlation between teacher knowledge and student achievement, and suggested that the professional development program "would have to be more efficient than the PD tested here in improving [skills knowledge] on an annual basis" (Garet et al., 2010, p. 54).

Four years after these findings, Gersten, Taylor, Keys, Rolfhus and Newman-Gonchar conducted a review of evaluations similar to Yoon et al.'s 2007 study (Gersten et al., 2014). These researchers examined professional development programs focused on improving math thinking for students. Out of 643 studies, the team found five that met What Works Clearinghouse standards. Only two of those had a positive effect on student achievement. These two studies supported earlier findings of what makes professional development improve student learning. Perry and Lewis (2011) used a fraction tool kit to help teachers create their own lessons in fractions and lead professional development sessions for each other. Sample McMeeking et al., (2012) evaluated a program that enrolled teachers in two summer courses focusing on math content (80%) and pedagogy (20%). Teachers engaged in follow up sessions throughout the year focused on designing lessons based on the math courses. Though these two programs supported earlier empirical evidence of effective professional development, the researchers found the dearth of quality evaluations significant. They suggest, "until more causal evidence becomes available, schools and districts must supplement the limited evidence of effectiveness with their best judgment" (p. 3). I agree that more studies will help show what works. Empirical evidence alone has not provided a solution. There is a powerful thread running through these evaluations, though it is difficult to measure: the studies that move student learning forward intentionally treat

teachers as adult learners. They share agency with the teachers and focus on pedagogy that shares agency with students.

This approach may be pointedly useful in the wake of the high stakes climate fueled by standardized testing (Gunzenhauser, 2012). Gunzenhauser argues that the pressure in the public school system to reach the untenable standards of NCLB has weakened educators' agency, making them submit to the dictates of the tests instead of asking them to grow in their practice and nurture better student learning. Districts, schools and teachers have focused on better outcomes on high stakes tests instead of better reasoning, communicating and application skills, skills that national and international leaders in education argue are the ones our students need, and the ones at the heart of the most current shift in educational policy (Organisation for Economic Cooperation and Development [OECD], 2013; Rentner, Kober, & Center on Education, 2014; Wagner, 2010). Teaching teachers to develop student thinking requires a shift away from traditional passive, short-term workshops toward the mutually accountable, engaging, collaborative learning fostered by the programs supported by empirical research (Perry & Lewis, 2011; Strike, 2007).

Current evidence leaves an unclear picture of what makes teacher learning effective. Empirical evidence suggests guidelines for time, engagement, content, collaboration and coherence that have lead to gains in student learning in many programs—though not all. Adult learning theory suggests that teachers move through four basic phases of learning—seeing the need for growth, creating a strategy to address it, implementing the strategy, and assessing it—to change their practice (Knowles et al., 2011; Merriam & Bierema, 2014). The intersection of these two frameworks points to that murkier, necessary aspect of learning: the agency of the teacher as a professional educator. This is the centerpiece of Sullivan and Glanz's three tiers of supervision (2012). While I agree with Gersten et al. (2014) that educational leaders must use

our “best judgment” about effective professional development, I believe that the concept of attenuated professional agency in professional learning is a lurking factor in many evaluations, causing many programs to go through the motions of high quality professional development without actually helping teachers change their practice (Garet et al., 2010). Considering programs from both the empirical research perspective and an adult learning theory perspective may shed light on the degree to which programs release agency for learning (and teaching) to the teachers, and the degree to which the programs are effective in promoting student learning.

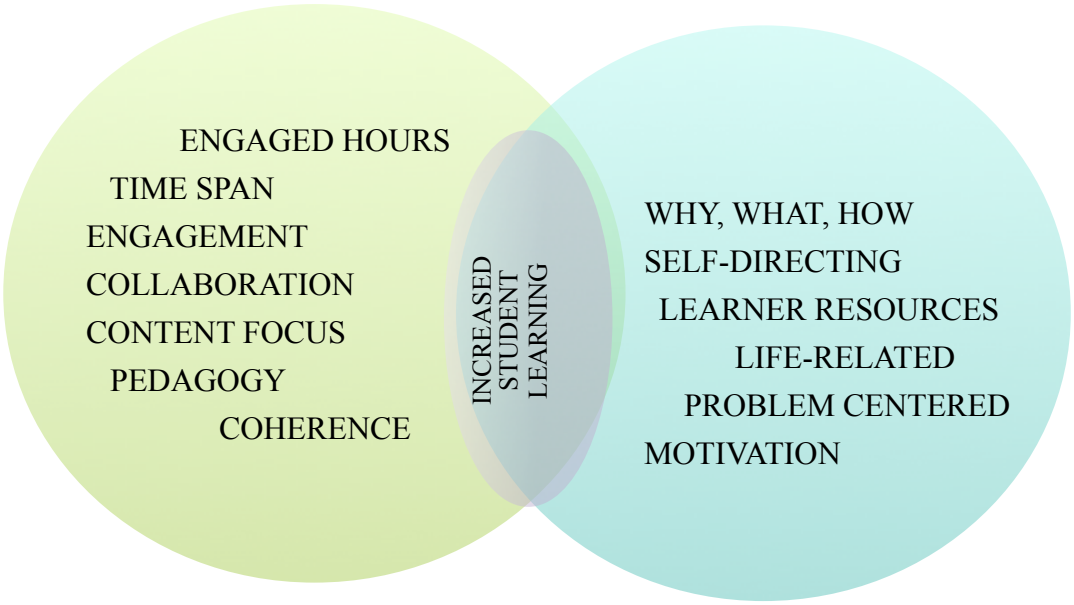

Figure 1. Combined perspectives

2.2 CURRENT PROFESSIONAL DEVELOPMENT PRACTICES

Since NCLB mandated high quality, research supported professional development in 2002, professional development for teachers has continued to grow in hours and funding. While some

programs reflect changes based on the IES evidence, one-day workshops and passive presentations persist. This chapter will describe some of the current practices in professional development, outline several states whose professional development is moving student learning forward, and examine trends that may point to future initiatives in teacher learning.

2.2.1 Current practice overview

Several large publications describe current practices in professional development, including the Schools and Staffing Survey conducted by the National Center for Education Statistics, Wei, Darling-Hammond, Andree, Richardson and Orphanos' 2009 article for Learning Forward and Wei, Darling-Hammond and Adamson's 2010 article describing four state-wide case studies. A large-scale report considering the longitudinal effect of NCLB on professional development also explains current trends (Birman et al., 2007), and The New Teacher Project published its own study in August of 2015, providing a very recent overview of professional development in the United States.

According to this data, districts in the U.S. are currently spending an average of about $18,000 annually for each teacher's professional learning (TNTP, 2015). A large majority of teachers, almost 90%, report receiving professional development in their content area but only 24% of those teachers reported spending more than 33 engaged hours (Wei et al., 2010). Yoon's (2007) work suggests effective programs engage teachers for 49 hours on average (Wei et al., 2010), though a few programs affected student learning with little more than 14 hours. While the exact number of hours a program needs to change teacher practice and student learning is not a precise prescription, the fact that most teachers are receiving less than the average hours needed to affect student learning is troubling. Teachers in high performing countries receive many more

hours than teachers in the U.S. Our teachers spend about 80% of their work time teaching, and 20% on duties, planning and professional development. Teachers in OECD countries spend about 60% of their time teaching, with professional development built into their regular work schedules (Wei et al., 2010).

During these engaged hours, U.S. teachers are spending time in workshops, university courses and district created seminars. SASS statistics show that 92% of U.S. teachers are attending workshops each year, a number on par with international participation (Wei et al., 2010). Though NCLB mandates schools and districts avoid one-day events that seem to have little effect on student learning, workshops continue. Wei and colleagues mapped a trend in workshop implementation: when time for professional development decreases, districts tend to include more short-term workshops—the least effective method to help student learning (Wei et al., 2010; Yoon et al., 2007). Reprioritizing time toward more effective activities seems an obvious solution, but seems challenging to implement. I discuss this further in the next section. About a third of teachers reported attending university courses, though the percentage of teachers attending them varies widely from state to state (TNTP, 2015; Wei, et al., 2009). For example, 15% of teachers in Texas reported attending a university course, while 79% of teachers in Idaho did (Wei et al., 2009). This difference likely stems from state and district policy and funding (Jaquith et al., 2010). Districts are designing and implementing a variety of professional development strategies for teachers, supporting content area work as well as district initiatives, technology trainings and changes in policy. These programs tend to help teachers by clearly aligning with state and district goals and standards (Birman et al., 2007; TNTP, 2015).

About a quarter of teachers reported professional development activities involving collaborating to review student work, discuss instructional strategies and improve their instruction (Birman et al., 2007; Jaquith et al., 2010). Approximately 20% reported leading these

collaborations, modeling a lesson or facilitating teacher feedback to each other about instruction (Birman et al., 2007). Most teachers report working with colleagues, departments or grade levels in some way about instruction, but the average amount of structured hours for collaboration per week is only 2.7 (Birman et al., 2007; Wei et al., 2010). In spite of these hours, the school climate seems to have grown less collaborative in the last ten years. On the 2003 SASS, 34% of teachers characterized the climate in their school as collaborative, but the number dropped to 16% in 2008 (Wei et al., 2010). Since then, the IES has not included collaborative questions on the SASS survey for the sake of length, leaving the question of how collaborative professional development activities are affecting collaborative instructional practices.

Differences in the level of education and socio-economics of the district also correlate with differences in professional development activities among teachers. In Birman et al.'s longitudinal study of professional development funded by Title I, 13% of elementary teachers and 16% of secondary teachers reported participated in more than 24 hours of in depth study of reading (2007). In math, 6% of elementary teachers and 10% of secondary teachers reported more than 24 hours of professional development (Birman et al., 2007). Other topics, including technology, special education and classroom management also varied in intensity according to the level of education. Professional development also varied according to the socio-economic status of the district. Teachers who worked in high-poverty areas tended to receive more time in content area professional development (Birman et al., 2007; Wei et al., 2010). Teachers in high-minority schools received more hours on average than low minority schools (47 hours vs. 39 hours), and those teachers reported little say in the professional development they received (Wei et al., 2010). The professional development also tended to be cohesive with school and district goals, but did not take into account the teachers' goals or prior learning (Birman et al., 2007). One case study in high-poverty, high-minority schools challenged the policies reported by

Birman and colleagues and found that allowing teachers the freedom to work in grade level teams to design their own instructional changes with support from the principals helped them change their practice and improve student learning, but this policy remains the exception (Saunders et al., 2009).

2.2.2 Four examples of state policy on professional development

In their study of changes in professional development since NCLB, Jaquith, Mindlich, Wei and Darling-Hammond focused on four states whose professional development for teachers seems to be improving student learning in those states (2010). Colorado, Missouri, New Jersey and Vermont addressed their teachers' learning needs in different ways, influenced, supported and constrained by their state's policies on education.

Colorado's state board created an intermediate level of support for districts called the Board of Cooperative Services. These groups support the three main goals of Colorado policy: creating a strong positive behavioral intervention support (PBIS) system; a response to intervention (RtI) system, and the use of data analysis to inform instruction. Teachers' professional development involves workshops and courses through the intermediate units supported by coaching and mentoring on campus. The aim of the Colorado Department of Education "is to model and support a culture of inquiry…focused on collaborative examination of school data, assessment of needs…and looking at results, from the level of the individual student to the school," (Jaquith et al., 2010, p. 21). The department's clear goals and embedded initiatives create a coherent structure for teachers to grow their practice in collaboration with each other.

Missouri established a Professional Development Committee (PDC) structure with PDCs at the state, district and school levels. Regional Professional Development Committees (RPDCs) actively support schools within a two-hour driving distance. Missouri ensured that every school fell within this distance so that all students and teachers could benefit from this intermediate support. PDCs evaluate needs of teachers according to student learning results and create professional development solutions, including financing. To ensure these practices were truly helping student growth, Missouri conducted state audit of professional development programs in 2010, looking at initiatives and student achievement. It found four programs helpful, and sustained them. It also found that thirteen were not helpful, and eliminated them. Policies that support robust financing for professional development; provide local support; incorporate teacher voice and mandate proven strategies have helped create a culture of professional expectation in Missouri (Jaquith et al., 2010).

New Jersey schools have created a powerful support system for developing their professional development programs. School Professional Development Committees examine student data and draft plans for professional development for the school. After using a backward design plan with a common template, they submit their plans to a district committee to evaluate at the district and county level. To support this literal ground-up strategy, the state created a guiding document, brought in speakers and built an on-line tool kit and series of webinars. Jaquith and her colleagues suggest that this collaborative approach to professional development design creates accountability and provides a strong, transparent reason for teachers to engage in the development and change their practice (2010).

Vermont uses a grassroots approach as well. It was an early adopter of professional development standards and created an intentional balance between local and state guidance. Professional development programs in Vermont tend to focus on a handful of initiatives,

including innovative instructional practices, portfolio assessments in math and writing, project and computer based learning and differentiated assessment. Vermont's policy of strong local control does not protect districts from socioeconomic gaps, however, and professional development in Vermont does tend to reflect the socioeconomics of the districts (Jaquith et al., 2010).

Within the four states highlighted in the Jaquith report, several best practices for teacher learning programs emerge. Each state purposefully examined student learning needs to inform professional development programs for its teachers. It created a clear vision for those programs through stated priorities for instruction and policy documents outlining expectations for professional development. Each state created a system for accountability, some at local levels and some through district and state evaluation. The states also created a sustainable infrastructure of supporting groups or local control to maintain high quality programs, and each state also created a clear funding stream with fairly stable resources.

The authors suggest that many states in the United States currently share many traits with these four, but the four show professional development programs working for students using very different structures and systems.

2.2.3 Future trends for professional development

Though many traditional programs still dominate the professional development landscape, several new trends are emerging. Wei and colleagues' 2009 report found that 40% of teachers in the U.S. are using action research projects as part of their professional development work. In Pennsylvania, action research can serve as part of a teacher's differentiated supervision, providing teachers support and accountability in this work.

In 2009, less than half of teachers in the United States reported having a say in their professional development initiatives (Wei et al., 2009), but teacher choice has grown much more important in the last few years (TNTP, 2015). Some districts are now building a catalogue of courses and workshops from which teachers choose.

A third trend with old roots continues to gain ground in some areas. The idea of a small group of teachers moving through the cycle of analyzing student work, creating strategies for instruction, implementing them, assessing student results and then analyzing the current work again to begin the cycle anew—this is an old strategy that has recently entered the spotlight again. Jaquith and colleagues highlighted it in New Jersey and Colorado (2010). Learning Forward (2015) published a description of this cycle in their paper that redefined teacher learning, and most recently included it in the standards for teacher growth. Many empirical studies forming the evidence base for effective professional development include these cycles in their interventions (e.g. Jacobs et al., 2007; Marek & Methven, 1991; Perry & Lewis, 2011; Sample McMeeking et al., 2012; Saunders et al., 2009; Saxe et al., 2001). Whether the title of the program is professional learning community, lesson study, friends' circles, or collaborative planning and feedback, groups of teachers working together to enhance their instruction has produced powerful results for student learning.

2.2.4 Current practices: conclusion

Workshops, university courses, action research, and professional learning communities have served as platforms for professional development for years, and they continue. As states respond to changes in federal regulations with the newest iteration of the Elementary and Secondary Education Act, they may develop new infrastructure for professional development, or pass more

state-specific guidelines for their districts. The basic questions remain. How can we help teachers continually improve their practice throughout their careers? How can we ensure that teacher growth has a positive effect on student learning? How can we support effective professional development programs and how can we assess them to ensure their value for students? How can we allow teachers the freedom to act as professionals, to learn as adults, and still achieve goals which stem from the district? The next section of this paper will wrestle with some of the challenges marking professional development for teachers today.

2.3 CHALLENGES IN PROFESSIONAL DEVELOPMENT

Earlier I outlined the body of empirical evidence suggesting qualities of professional development programs that positively influence student learning. I also offered the theories of adult learning and personal agency as two of the missing components in professional development evaluations. After considering what is currently happening in teacher learning in the United States, the value of that learning remains unclear.

This chapter will explore some of the difficulties facing educators as they attempt to design and implement effective professional development systems and programs. These challenges include the messy task of evaluating professional development and difficulty of funding it efficiently, especially considering the best practices suggested by empirical evidence and adult learning theory. I will consider the New Teacher Project's (2015) conclusion about how to improve the system and will offer an alternative perspective inspired by Argyris and Schön (1996).

2.3.1 Challenges in evaluation

One of the major challenges facing effective professional development design is the lack of robust evaluations of professional development programs. Prior to Kennedy's (1998) seminal study, programs evaluations focused on teacher perception of learning and self-reports of changes in practice. Kennedy introduced student learning as the metric of program effectiveness. This shift simultaneously connected professional development programs to student learning and highlighted the difficulty in creating effective evaluation designs in this complex system.

Thomas Guskey explored the complications of using student learning outcomes as a primary metric in evaluations (2000). In his text describing effective evaluation, Guskey walks the reader through the deceptively simple process of effective professional development. He states that it should inform teachers of new knowledge and skills; facilitate their learning to the degree that it changes their instructional behavior, and those changes should improve the way students are learning (Guskey, 2000). To measure these changes, Guskey describes measuring the quality of the program in terms of organization, content, method, facilities and expense; measuring the cognitive, affective and behavioral changes it evokes in the teachers, and considering how those changes appear in student learning, teacher behavior and in the system of the school. This three-fold evaluation is inherently complicated. It includes objective observations of the program; measurements of affective inputs and outcomes and assessment of the results in student, teacher and community changes.

Yoon's (2007) meta-analysis of professional development evaluations showed that researchers had not made much progress in the 20 years since Kennedy's monograph. While the quality of the nine studies that met the Institute of Education Science's standards was strong, the paucity of studies does not strengthen that empirical base.

Desimore (2009) argued for a conceptual framework of professional development evaluations that stems from Yoon's and Kennedy's work, and several studies have incorporated that perspective (e.g. Garet et al., 2010; Gersten et al., 2014; Guskey et al., 2012; Jaquith et al., 2010; Perry et al., 2011; Sample McMeeking et al., 2012; Saunders et al., 2009). The results remain inconsistent, however.

Some programs that use the empirical base for professional development best practices yield powerful results in student learning changes (e.g. Perry et al., 2011). Others did not have any noticeable effect on student learning, though they followed many of the best practices (e.g. Garet et al., 2010; Gersten et al., 2014). Gersten and colleagues (2014) suggested that "the limited research on effectiveness means that schools and districts cannot use evidence of effectiveness alone to narrow their choice. Instead, they must use their best judgment until more causal evidence becomes available," (p. 1). I agree that the empirical evidence does not provide enough information to ensure effective professional development for teachers, but I suggest that developers use more than their best judgment in designing effective programs. Adult learning theory offers a framework for understanding how programs meet teachers' needs as learners and ensure their effectiveness. The concept of agency focuses on a release of responsibility for learning to the teachers and considers how they will use the learning in the future.

Garet et al.'s 2010 study provides a good example. Supported by the Institute of Education Sciences, the researchers conducted an evaluation of professional development for seventh grade math teachers. The program focused on building teachers' capacity for teaching rational numbers topics. Researchers hired two companies, America's Choice and Pearson Achievement solutions, to design a program based on empirically supported best practices. The programs included over 49 engaged hours (about 68 for the first year and 46 hours the following one), spanned over two years, and used engaging activities that were focused on content and

pedagogy and were coherent with the goal of improving students' work in rational numbers. In spite of this, the programs did not move student learning forward.

In their analysis, the researchers describe several issues that directly conflict with adult learning theory or that kept the agency for learning in the hands of the facilitators and not the teachers. First, the curriculum companies trained facilitators to lead the professional development of all the seventh grade math teachers in twelve districts. The researchers suggest that having trained facilitators instead of experienced educators or could be the cause of the failure. I agree. Looking through the lens of adult learning theory clarifies some of the differences. The facilitators were trained to teach specific language about rational numbers, teach common student misperceptions and coach teachers in their lessons (Garet et al., 2010). The facilitators did not intentionally allow the teachers the flexibility to present student misconceptions they had encountered in their past experience, suggest solutions they had found successful or evaluate each other's teaching. Adult learners need to connect with their own experiences to deeply engage in learning new material (Knowles et al., 2011; Merriam & Bierema, 2014). When they have mastered a skill, they need the freedom to explore it and evaluate it. Better facilitation may have offered the teachers the flexibility they needed to learn how to teach rational number concepts effectively.

The researchers also mention that the program was specifically designed to build teachers' capacity for instruction. No pre-test for teachers' understanding of rational number concepts or assessment afterward helped the teachers understand their own knowledge of rational numbers themselves (Garet et al., 2010). Adults need to know why they are learning something if they are to make it meaningful in their practice (Knowles et al., 2011; Merriam & Bierema, 2014). Focusing on the instruction of content without addressing the teacher's understanding of the content is akin to asking a teacher to teach driver's education without asking if the teacher is

comfortable parallel parking. If the teacher has not mastered the whole content, the student's learning will suffer. The professional development program that helps the adult safely uncover and strengthen areas of weakness can help the teacher teach effectively. This allows teachers to see their own understanding and then consider the content from the student's perspective. Ignoring this ignores the adult learner.

Garet and colleagues also explain that the teachers engaged in individual and group activities where they solved problems and presented their solutions (2010). They also worked with facilitators as coaches, when the facilitators observed the teachers in the classroom after a professional development session. While active learning and feedback are helpful for learners, adults need to create their own strategies, implement them, and assess them to learn. The program did allow teachers the chance to create some instructional strategies and implement them. It did not allow them to assess them, though. Instead, the evaluation of the teachers' practice remained in the hands of the facilitators. Teachers did not observe each other's practice and coach collaboratively. They did not have an intentional opportunity for self-reflection after a coaching session. In fact, Garet (2010) mentions that teachers had no outside classroom work in this program, no follow up collaboration with each other and no outside requirements for content. Adult learners need to make the learning their own (Knowles et al., 2011; Merriam & Bierema, 2014). One reason this program may have not succeeded is that the engaging, meaningful activities did not transition to independent action on the part of the teacher.

At the turn of the century, Guskey (2000) suggested evaluating professional development in terms of the program, how it changes teacher behavior, and how it affects student learning. The body of empirical research suggesting aspects of the program that have been effective in promoting better student learning outcomes in the past provides at least a beginning framework for evaluating the program's quality (Yoon et al., 2007). There is a wealth of standardized tests

to measure changes in student's learning in a myriad of subjects. The part of professional development that the empirical studies do not always measure is observable changes in teacher behavior (e.g. Garet et al., 2010). This may be because it is not the final outcome of the professional learning program, but it could be the angle that helps researchers understand how the program meets teachers' needs as adult learners to help them grow their practice.

Evaluating professional development programs is challenging. Measuring the quality of the program, changes in teacher behavior and changes in student learning are all necessary to understand the effectiveness of the program (Guskey, 2000), but these measurements require extensive work. That does not take into account the messy nature of the school community, where interruptions, personnel shifts, administrative changes and school board direction all affect each component of the system. Using the empirical studies as a framework for evaluating the program logistics; adult learning theory as the guide for evaluating its appropriateness and standardized evaluations to measure student learning is a sound, three-part approach researchers have used to some degree for almost twenty years. I suggest that ensuring the learning is appropriate for teachers is a key piece to strengthening evaluations.

2.3.2 Challenges in funding professional development

The federal government spent about $2.3 billion to finance professional development programs in 2014 (Loveless, 2014), and that number may only represent a fraction of funds districts contributed to professional development (Odden, Archibald, Fermanich, & Gallagher, 2002). The New Teacher Project (2015) estimates that districts are spending an average of $18,000 a year per teacher, and that the largest 50 districts in the United States are spending about $8 billion annually. All of this funding fuels the frustration around professional development.

Though it is clear that we are investing a great deal to improve teaching and learning, exactly how much we are spending, where the funds are going and what the return on the funds is are all murky details.

Quality professional development is expensive (Guskey, 2000; Odden & Archibald, 2001). If we judge the quality of programs by the body of empirical research, they require a minimum of 49 engaged hours over at least a semester of teaching. They must align with the schools' and states' goals for student learning and cohere to teachers' own goals for growth. They must have active instruction, focused on content and on the best ways to teach it, and much allow teachers to collaborate. These parameters are challenging enough without considering the cost behind them. If programs are actually going to move student learning forward, paying for the expertise, activities and time required for quality programs is essential (Guskey, 2000; Odden & Archibald, 2001; Odden & Busch, 1998; Odden et al., 2002, TNTP, 2015).

Accounting for professional development funds is another challenge. Traditional public school finances are based on cost accounting models that track expenditures using broad categories, including objects (e.g. salary, maintenance, equipment), function (e.g. instruction, safety), or program (e.g. special education, on-line credit recovery) (Odden et al., 2002). These broad categories sometimes obscure the specific costs of a complex program such as professional development. Fees, hotel expenses, technology fixes and substitute teacher pay could fall in different categories, but are all needed in a typical professional development program. Schools may underreport expenses when their programs include professional learning communities that meet within the school day, or the use of teachers as instructional coaches to facilitate their colleagues' learning. Because of the complexity of accounting for teacher learning costs, districts' methods yield very different results. Odden and colleagues (2002) offer, "for example, in one district, researchers learned that the reported budget for professional development was

$460,000. Following a detailed study, however, those researchers, Miles and Hornbeck, found that the district actually spent $8.9 million on professional development—about a twenty-fold difference" (p. 57). Transparent, accurate accounting for professional development funds gives stakeholders a clear picture of the money the district is investing in professional development, but helpful accounting presents a significant challenge.

Decisions about allocation of funds offer another puzzle for professional development designers. Logistically, states have created very different systems for providing teacher learning through state centers of learning, intermediate providers that supporting districts and schools and school-designed programs (Jaquith et al., 2010). Funding these varied levels stems from a variety of sources, including federal, state and local funding. Within the district and local level, policy makers face several larger questions about which program to fund and why.

Ethically, policy makers determine the best use of their funds to promote student learning. If they aim for the maximum benefit, the professional development program may help the majority of students, but ignore special learning needs of some. If districts try to support students according to their individual needs, though, students who enter school with a paucity of vocabulary or students with significant cognitive needs could sap the system of funds for the majority. Strike (2007) suggests approaching the ethics of funding by aiming "at what is possible given the resources we have," (p. 81). By considering the needs of the majority of students, individual students and the resources available, school leaders may create a strategy that helps improve instruction and nurture a healthy community.

Strategically, policy makers must balance two separate issues of coherence: effective professional development aligns with school goals and state standards for student learning, and yet must align with teacher goals for growth (Gunzenhauser, 2012; Guskey, 2012; Knowles et al., 2011; Merriam & Bierema, 2014; Yoon et al., 2007). This balance can create an ethical

dilemma. If teachers are disenfranchised by inflated pressure to raise student test scores, they may give up the idea that their own goals for growth matter (Garman & Holland, 2015; Greene, 1997; Gunzenhauser, 2012). Teachers may simply approach professional development with crossed arms, ready to fulfill a requirement for their job, but not open to authentic growth—not even hopeful of that possibility. Schools who want to use teacher learning to improve instruction must first allow the teachers the space to create their own goals, and provide professional development opportunities to support them. This is the challenge that schools have not generally accepted: how do schools allow teachers to use their agency as professionals and still ensure teacher growth helps move student learning in the direction schools want? This strategic question is beginning to emerge as schools invest in more opportunities for teachers to choose professional development opportunities.

2.3.3 Challenges in reforming professional development

The question remains: with billions of federal and local dollars spent on professional development for teachers, what is needed to ensure a good return on the investment? What is necessary to ensure teachers are developing capacity to give children the highest quality instruction? Using student achievement as the primary metric for evaluations has been the standard since Kennedy's work in the late nineties (Kennedy, 1998). Searching for best practices through empirical research has provided a small, clear body of evidence to show what to include in successful programs (Garet et al., 2010; Garet et al., 2012; Yoon, 2007), though programs that draw from these practices do not always move student learning forward. The concepts of adult learning and teacher agency may help illuminate some of the lurking variables in the research and may provide a strong support to the evidence based best practices (Garman & Holland, 2015;

Knowles et al., 2011; Merriam & Bierema, 2014). Yet teacher perception and student scores still show professional development is not moving student learning forward (Birman et al., 2007; Blank et al., 2008; Garet et al., 2012 TNTP, 2015). How do we actually improve professional development for teachers?

In the summer of 2015, the New Teacher Project published a stark report entitled, *The Mirage: Confronting the Hard Truth about Our Quest for Teacher Development*. The "mirage" of the title is the hope that small changes in professional development will improve enough to move student learning forward. The authors argue that policy makers have implemented these small changes for years, with no significant result. "Instead, we must acknowledge that getting there will take much more than tinkering with the types or amount of professional development teacher receive, or further scaling other aspects of our current approach. It will require a new conversation about teacher development—one that asks fundamentally different questions about what better teaching means and how to achieve it," (TNTP, 2015, p. 7).

The authors suggest better accountability for teacher growth, meaning evaluation models more closely linked to student learning, measured by standardized tests. "A thoughtful accountability system can help address the lack of urgency around teacher improvement we observed in districts we studied and positively reinforce growth. Creating meaningful rewards and consequences can send a clear message that improvement should be a top priority, and energize teachers about opportunities to innovate and grow." (TNTP, 2015, p. 36). I believe this is the place where the authors' "fundamentally different questions" fell short, since high stakes accountability and high stakes evaluations have been growing in educational policy since NCLB, (Gunzenhauser, 2010; Strike, 2007). Simply improving perceived incentives or consequences for teachers may not address urgency or energize teachers. It will likely strengthen the passivity and lack of mutual accountability our teachers are currently suffering (Gunzenhauser, 2010). Instead,

Argyis and Schön's (1996) double loop thinking can open the door to the "fundamentally different questions" the authors' recommended.

Consider the problem from other side of Labaree's (2010) layered system. Instead of considering policy from the way policy makers "give teachers" a perspective, "encourage improvement" or "reconstruct the teacher's job," (TNTP, 2015), one could assume that 1) teachers are professionals interested and intrinsically motivated to grow and that 2) districts and schools are responsible for providing the direction, resources, and shared responsibility teachers need to build capacity. This is fundamentally different than attempting incentives and modified delivery of professional development; it considers the teacher's needs as a professional first, instead of the system's needs of the teacher.

This reform direction is already in place in pockets throughout the United States. The New Jersey Department of Education, for example, has said that its priority is to help teachers work together to solve problems in practice, using data, discussion, questioning and collaboration, (Jaquith et al., 2010). The policy focuses on using a teacher-led, teacher supported perspective to improve practice, with student learning data and collaborative work as the metrics for assessing growth. The state board of Missouri is balancing teacher voice in its Professional Development Centers with accountability for growth, (Jaquith et al., 2010). Teachers advise the professional development programs at the school, region and state level, but the state also conducts audits of professional development programs to help see which program is yielding results in student learning. Colorado has taken another approach to this balance between teacher perspective and state level goals. At each school, a team of teachers creates professional development activities that use student data, assessment of needs, creation of strategies and use of research supported initiatives and ongoing evaluation of the work within professional learning initiatives, (Jaquith et al., 2010). It is worth noting that this cycle of activity matches the stages

of adult learning, allowing teachers to improve student learning as they nurture their own capacity (Knowles et al., 2011; Merriam & Bierema, 2014). To keep these activities focused on state goals, Colorado only provides funding for specific plans, not for general professional development. Initiatives such as positive behavior intervention and support (PBIS) and the response to intervention (RTI) are two of its primary foci, (Jaquith et al., 2010). Other districts, such as my home district in southwestern Pennsylvania, are providing a menu of options for teachers' activities based on district goals, and are supporting them through the teacher evaluation tool and through early release days throughout the year. This reform is slowly shifting from telling teachers what policy makers think they should know to providing teachers resources and expectations for growth as professional educators.

The authors of the TNTP report found that, "teacher development appears to be a highly individualized process, one that has been dramatically oversimplified," (2015). Treating the individual teacher as a professional is the challenge. Finding a way to incorporate teacher agency in their own learning will allow us to create policies that treat teachers as professionals and put the onus for growth on them, leaving districts to support and enforce high expectations for growth.

There is one player in the system powerfully placed to promote professional development in this complex model: the building level principal. The principal can work within the structure of the district to help each teacher engage and take responsibility for his own growth. The principal can advocate for specific resources and infrastructure that will benefit her teachers as they address their learning needs. She can also help teachers collect and analyze data to determine the effectiveness of their professional development activities. The principal who understands the empirical body of evidence yielding the best practices for professional

development, the theories behind adult learning and the concept of agency may have the tools she needs to help foster this reform one building at a time.

2.4 CONCLUSION: PROFESSIONAL DEVELOPMENT EFFECTIVENESS, OVERVIEW AND REFORM FROM THE LEVEL OF PRINCIPAL

This chapter addressed three questions about professional development for teachers: what makes it effective? What do professional development activities and structures currently look like? What challenges do principals face when choosing professional development for teachers?

Of the three questions, the last changed the most in the course of this writing. Instead of viewing professional development reform as a task of the principal to enact *for* the teacher, the ideas of adult learning theory and teacher agency ask how the principal is fostering, supporting and ensuring professional growth *with* the teachers. This shift moves the principal from a behaviorist enforcer using economic tools (TNTP, 2015) to a leader in a challenging context, providing the expectation, resources, direction and boundaries for teacher growth (Hallinger & Heck, 1996; Heifetz, 1994). This, I believe, is the challenge. As the key player in the system, accountable to the district and state above and the teachers and students below, the principal is wholly accountable and responsible for making sure professional development is effective to build capacity in her teachers (Metropolitan Life Insurance, C., & Harris Interactive, 2013; National Center for Education Statistics, 2012; Sabina, 2014; Sullivan & Glanz, 2013). This does not mean teachers should abdicate their agency to the principal. On the contrary, part of the principal's work must be supporting teachers as they take on the work of directing their own professional growth (Garman & Holland, 2015; Gunzenhauser, 2010; Strike, 2007).

A principal may face this challenge by considering professional development from three lenses: empirical evidence, adult learning theory and teacher agency. These concepts, along with an honest assessment of the limits principals face, may help principals make effective decisions for professional development for teachers. The table below highlights where these factors appear in the literature.

FACTORS LEADING TO EFFECTIVE PD										
AUTHOR	**CONTEXT**	engaged hours	duration	active engagement	collaboration	focus: content	focus: pedagogy	coherence: school goals	coherence: teacher goals	effective
Carpenter, et al., 1989	empirical	80 hrs	summer	X	X	X	X	X	X	X
Cohen & Hill, 2001	empirical	20 + hrs	year	X	X	X	X	X	X	X
Cole, 1992	empirical	70 hrs	year				X	X		
Desimone et al., 2002	empirical	> 7 hrs								
Duffy et al., 1986	empirical	10 + hrs	year				X	X		
Garet et al., 2001	empirical			X	X	X	X	X	X	X
Garet et al., 2010	empirical	68 hrs	year			X	X	X		
Garman, 2006	agency			X	X				X	X
Gersten et al., 2014	empirical	14 + hours				X	X			X
Greene, 1997	agency			X	X				X	X
Gunzenhauser, 2012	agency			X	X				X	X
Jacobs, et al., 2007	empirical	65 hrs	year	X	X	X	X	X	X	X
Knowles et al., 2011	adult learning			X	X			X	X	X
Marek & Methven, 1991	empirical	100 hrs	summer	X	X	X	X		X	X
McCutchen et al., 2002	empirical	70 hrs	year	X	X	X	X	X	X	X
McGill-Franzen et al., 1999	empirical	70 hrs	year	X	X	X	X	X	X	X
Perry & Lewis, 2011	empirical	35 + hrs	year	X	X	X	X	X	X	X
Porter et al., 2000	empirical		year				X			
Sample McMeeking et al., 2012	empirical	25 + hrs	semester	X	X	X	X	X	X	X
Saunders et al., 2009	empirical	20 + hrs	year	X	X	X	X	X	X	X
Saxe et al., 2001	empirical	70 + hrs	year	X	X	X	X	X	X	X
Sloan, 1993	empirical	5 hrs	fall				X	X		
Sullivan & Glanz, 2013	adult learning		year	X	X	X	X	X	X	X
Tienken, 2003	empirical	8 hrs	spring	X	X	X	X	X	X	X
Yoon et al., 2007	empirical	14 + hours	summer +			X	X			X

Table 2. Survey matrix

Three surveys in the literature will help frame these questions, the *MetLife Survey of the American Teacher,* from MetLife and Harris Interactive (2013), the National Center for Education Statistics' (2012) *Schools and Staffing Survey*, and The New Teacher Project's 2015 survey for their publication *The Mirage*. Together these three surveys provide examples of questions, metrics and analysis that will help me create my own research tool to explore what aspects principals consider when making decisions about professional development for teachers.

3.0 METHODOLOGY: EXPLORATORY STUDY

This chapter provides a five-part overview of the study exploring what factors principals consider when making decisions about professional development for teachers. The first section describes the research design and the rationale behind it. The second explains the selection of survey participants and interviewees. The third part details the survey and interview protocol. The fourth section explains data collection and analysis procedures. The final section of this chapter addresses the integrity and validity of the study design.

3.1 RESEARCH DESIGN AND RATIONALE

This mixed methods exploratory study used a survey sent to a broad sample followed by a semi-structured interview of targeted subjects to explore this research question:

What factors do principals consider when choosing professional development for teachers?

a) How do they view the body of empirical research that suggests best practices in professional development as they make decisions?
b) How do they consider the teacher's own agency in their decision-making?
c) How do they consider the tenets of adult learning in their decision-making?
d) How do principals' limitations play into their decision-making?

Though professional development has received thorough attention by evaluators and researchers, the idea of the principal as a key player in facilitating empirically supported experiences that honor teacher agency and adult learning theory has not. It is a fine-grained focus, arguably, but one that is particularly salient to my work as a principal. Because there is little known about this decision-making process, an exploratory direction helped lay the groundwork for understanding and even future research.

Mertens (2010) describes exploratory research as a practical way to begin understanding an unfamiliar field or phenomenon. I do not offer initial hypotheses about the principals' decision-making process, since there is a dearth of evidence about this phenomenon in the literature. I agree with Yin (2009) that exploratory studies do not always lend themselves to propositions.

Instead, I used a survey as the first part of this sequential mixed methods design to build a set of quantitative data. It asked questions about the actors, funding, time and logistics, questions ideally suited to a survey (Yin, 2009). I then analyzed this data for patterns and outliers, and began building an explanation of the decision-making process. The second step of the study involved a series of semi-structured interviews to uncover more of principals' thinking and perceptions of the process. Mertens (2009) suggests using sequential mixed methods design to create a broad understanding and then deep focus on a narrow slice of the data. Stake (1995) and Merriam (2009) suggest analyzing the data throughout the collection and Yin reminds researchers that as we prepare and collect data, we should go back to the design of the study again. This sequential mixed method design using a survey followed by an interview follows these guidelines.

3.2 SELECTION OF PARTICIPANTS

An electronic survey went out to the principals of all 87 schools serving kindergarten through sixth grade students with a Title I status among the 42 school districts served by the Allegheny Intermediate Unit. Elementary schools offer a narrower scope of content and pedagogy than secondary schools, helping focus the study. These schools share similar histories as outlying townships of a former steel mill city, and the same professional development resources from the same intermediate unit. Though the socio-economic status of their populations vary to a degree, selecting only schools with a Title I status in the region focused the study on schools with potentially the largest limiters, including a smaller income from a poorer tax base, fewer community resources, and fewer family resources entering the school from Title I communities. If principals feel limited by resources in these schools, students and families feel this lack directly. This vulnerability and potential for the school to help students in the community find a path through these limits also influenced my selection of these schools.

Using Yin's (2010) explanation building analysis (a focused pattern matching analysis), I analyzed the quantitative survey results as they came in. Following Yin's advice about replicating studies of complex cases—such as principals' decision making—I chose six interviewees to explore patterns that emerge from the quantitative data. Engaging in multiple semi-structured interviews provided a complex exploration of the decision-making process, helping not only understand the process more deeply, but also providing a context for assessing transferability of the results (Mertens, 2009).

3.3 SURVEY AND INTERVIEW PROTOCOL

This section details the two instruments I used to collect data: a quantitative survey and a semi-structured interview. I describe the source of the tool, the protocol and timeline along with literature to support this design.

3.3.1 Survey

The survey provided information about what factors principals are considering when they make professional development decisions. It asked the questions Yin (2010) outlines as ideally suited for this tool—who, what, where, how many, how much—about empirically based best practices in use, considerations of agency and adult learning, and the limits of resources and power principals face. I organized the questions in order of least threatening to potentially more uncomfortable, beginning with demographics questions and ending with limiters principals face when making decisions for professional development. I found three relevant national surveys already in the literature which I used as a guide for my own questions, a technique suggested by Mertens (2009). These surveys are the *MetLife Survey of the American Teacher: Challenges for School Leadership* survey (Metropolitan Life Insurance, C., & Harris Interactive, I., 2013), the National Center for Education Statistics' (2012) *Schools and Staffing Survey, Public School Teachers*, and The New Teacher Project's (2015) survey from *The Mirage: Confronting the Hard Truth about our Quest for Teacher Development*. I selected questions that answered my research questions and made minor modifications in some questions to target the response toward my research questions. The final survey questions are in appendix A.

Between November 30th and December 19th, 89 principals and assistant principals leading elementary level Title 1 schools served by the Allegheny Intermediate Unite (AIU) received invitations to the survey hosted by the University of Pittsburgh's Qualtrics platform. Participants tend to respond less frequently to on-line surveys than to traditional paper surveys (Converse et al., 2008; Misra et al., 2012; Nulty, 2008), so this study included three aspects suggested by Misra et al. (2012) to enhance participation: follow-up messages, statement of the "salience of the topic being evaluated to survey participants," and "social norm based appeals" (p. 90).

The Executive Director of the AIU sent out two separate messages with the study invitation to 30 principals. Her messages included a request to help out a fellow leader within our community. Invitations went out to 59 principals from the Tri-State Area School Study Council, with thanks to the Executive Director of Tri-State. Tri-State followed up two more times after the first invitation.

Mertens (2009) suggests researchers use a cost-effective strategy when deciding how to encourage respondents. The electronic introduction, endorsements, survey, and follow up emails met this recommendation. She also reminds the researcher to consider the participants' available time, interest in the topic, feeling of competence to contribute and any incentives. I tailored the invitation to the principals and their interest in effective professional development for teachers, and offered a concise summary of the results of the study for the entire potential participant pool.

3.3.2 Interview

The interview provided an in depth description from six principals about the factors they are considering when making decisions about professional development for teachers. This qualitative tool explored the complexities of decision-making in a way that the survey could not

(Merriam, 2009; Mertens, 2009; Stake, 1995; Yin, 2010). The connections between questions in this case are also intertwined: understanding and perception of empirical research suggestions, adult learning theory and teacher agency all influence each other. Yin (2010) suggests that simpler cases may only need two or three interviews to help answer the research question, but cases that are more complex may need four to six. As I analyzed the survey data, I selected six principals to participate in the interviews based on the questions that emerged and the principals who were in a position to speak to those questions (Merriam, 2009; Mertens, 2009). I had considered the possibilities that the survey results could have shown a strong correlation between the agency principals have and the agency they consider in choices about professional development; they could have shown a connection between limited funding sources and limited principal prerogative—or the reverse. I wanted to choose a group of principals who share a common pattern (e.g. including empirically supported practices and high teacher agency, or facing limiters of budget restraints and not incorporating empirical practices), or chose contrasting examples (e.g. of six principals facing budgetary restraints, three who incorporate many empirically supported practices and three who do not).

After analyzing the results of the survey, I found that the limits principals faced had almost no correlation to the factors they considered about empirically based best practices, teacher agency or adult learning theory. Instead, principals who considered best practices were also likely to consider teacher agency. Considerations of adult learning needs emerged as the factor principals acknowledged the least. I decided to select six principals whose leadership had earned the reputation for following best practices in education. I used the interview to explore how they considered the four factors of the research questions, with a particular focus on the connection between empirically suggested practices, teacher agency and adult learning. The head

of the Tri-State Area School Study Council assisted me in selecting a pool of potential interviewees from the original survey pool.

I contacted these principals directly by phone and sent each the list of guided interview questions before the interview. To create this guide, I followed Yin's (2010) advice and used the analysis of the survey, exploring connections emerging from the survey results. I considered possible connections between principal agency and the factor of teacher agency; tenure of principal and facilitating engaged professional development, or contractual time and teacher collaboration. These possible connections stemmed from my own experience as a principal and from the connections in Garet et al.'s study (2001). (The interview explored similar patterns in the survey data and asked the participant for her perspective as a principal. It began with neutral questions (which Yin [2010] calls "Level 1" questions), then moved to more complex questions focused on the answers the study is seeking ("Level 2" questions).

3.4 DATA COLLECTION & ANALYSIS

In this section I outline how I collected, securely stored, and analyzed the data from the two tools: the survey and the interview.

3.4.1 Survey collection and analysis

I entered my survey through the University of Pittsburgh and collected the data through the university's data collection service. I stored and analyzed all data according to the Institutional Review Board guidelines, using a password-protected computer kept in my home. All data

analysis was done on Excel with identification markers redacted before being stored. From the initial invitation, I allowed up to three weeks for participants to complete the surveys.

I began analysis of the aggregated data by comparing general results of principals by their limiters. For example, I compared principals who reported a good deal of control of professional development against those reporting limited control, exploring how their treatment of empirically supported aspects of professional development, teacher agency and adult learning compared given the limits the principals face. This was the comparison that yielded the least correlative results—an unexpected finding.

I also used correlational analyses across several factors to explore the relationships between factors principals consider and possibly unearth patterns and common themes. Garet and colleagues (2001) conducted a national survey asking teachers to report what they perceived to be effective professional development. They analyzed the many variables reported by the survey through a correlative analysis similar to the one I used in my study. Following Garet et al.'s (2001) study, my analysis included mean responses between factors, categories, and participants, and standard deviations for them. Where Garet et al.'s (2001) study sought to uncover causality between factors, however, my study only sought to explore correlation between them. I examined Garet et al.'s (2001) ordinary least squares analysis to inform my own linear regression, then followed the suggestion of Walk and Rupp (2010) and used a simple linear regression to yield a Pearson correlation coefficient, or *r*-value, appropriate for analyzing correlative relationships between two variables in social science research.

Yin (2010) suggests that this kind of exploratory study can help uncover patterns when no proposition is clear. I used the results of the survey to begin building an understanding of what factors principals consider when selecting professional development and how those factors

influence the final decisions they make, the programs they fund, and the activities teachers experience year after year.

3.4.2 Interview collection and analysis

Between February 1st and February 18th, 6 principals from the survey participant pool agreed to participate in a guided interview about their considerations for making decisions for professional development for teachers. All interviews were conducted over the phone, and temporarily recorded on the researcher's iPad through the Voice Record Pro application. Recordings were temporarily stored in the researcher's password protected Dropbox and transferred to NVivo software. Once transferred, the researcher transcribed the interviews into NVivo, deleted the recording in Dropbox and Voice Recorder Pro, and sent summaries of each interview transcription to the participant for a participant check.

Thirteen principals received email invitations and phone calls inviting them to participate, all recommended by the Tri-State Area School Study Council director after the initial survey data analysis. I followed Stake's (1995) advice and shared the guide with the interviewee before we began talking to engage the principal and let her know our direction from the start. I conducted the interviews over the phone and recorded them on my iPad, transcribing them myself. The iPad remained secure in my home when I was not using it to record interviews. I deleted the recordings as soon as I had transcribed them. The interview results remain confidential, and I protected the data in accordance with Institutional Review Board guidelines.

I analyzed the data in the transcripts with the help of NVivo software to help code data, construct categories and look for frequency, patterns and correspondences between them (Merriam, 2009; Mertens, 2009; Stake, 1995). Categories may included "teacher agency,"

"engaging activities," "coherence to school goals," and "coherence to teacher goals." I considered the results from the survey and interviews and played with the data, as Yin (2010) suggests. I created a matrix of categories and other visual tools to understand the connections that emerge. The triangulation of the data helped build a clear explanation of how the factors principals consider influence and affect professional development for teachers.

3.5 EXTERNAL VALIDITY, INTERNAL VALIDITY, GENERALIZABILITY

This section addresses issues of external validity, internal validity and generalizability of this study.

3.5.1 External Validity

Merriam (2009) asks, "what is it worth, just to get the researcher's interpretation of the participant's interpretation of what's going on?" (p. 212). Answering this question explains the external validity of an exploratory study—why it is a useful part of the conversation about a subject.

This study focused on a thin slice of the questions around effective professional development, looking at it through the eyes of the decision-makers in the schools. Principals see some limits of time, money and power (Hallinger & Heck, 1996). They may understand and value the empirical research showing aspects of effective professional development. They may also understand and value how adults learn and how teacher agency supports that learning. Using Garet's (2001) analysis of survey data as a model, I analyzed the results of the principal survey, parsing out what factors principals consider, how much, and how those relate to other factors,

looking for trends, patterns and outliers. I also performed an in-depth analysis of six principal interviews, looking at the relationship between factors from the rich perspective interviews offer.

Garet's (2001) study asked a national sample of teachers about their perceptions of effective professional development, then suggested relationships between those self-reported aspects. It laid the groundwork for future studies, offering avenues of possible connections for other researchers to examine.

This study attempts to add a word about the principals' viewpoint to the conversation around professional development. It focuses on the confluence of their perceptions of empirically suggested practices, adult learning theory, teacher agency and the limits they face in making decisions about teacher learning. Seeing the connections between different factors principals consider may show avenues to explore that can help principals support better practices in professional development for teachers.

3.5.2 Internal validity

This study relies on four features to uphold strong internal validity. They are construct validity, methodic, ethical data collection, reliability, and triangulation.

Yin (2010) reminds researchers that the questions in the surveys and interviews must actually answer the larger research questions of the study. This attention to construct validity ensures alignment between data collection and research questions from the beginning of the study. Following Yin's advice, I conducted a multi-step categorical analysis of the questions of the source surveys and only used the questions most aligned to the overarching questions of my study. Mertens (2009) suggest that self-reporting data are only as valid as the participants' honesty. The survey instrument and interview guide follow her advice to avoid emotional or

challenging questions—especially at the beginning of the questions. These two concerns helped frame questions that relate to the study's overarching questions and improve the chance that the self-reports are accurate.

This study used several tools to ensure methodical, ethical data collection and protect its internal validity. As Stake (1995) and Yin (2010) suggest, I kept records from the beginning of the research. Each source and iteration of the survey and interview instrument is documented and logged. A participant file keeps record of contact information, future contacts, results and questions. After the interviews, I returned a summary of the transcripts to the participants for them to confirm, expound or explain any answers further (Merriam, 2009; Stake, 1995). I have only provided survey data in aggregate and have used pseudonyms for any interview references—protecting the confidentiality of the participants.

The transparent protocols of this study also ensure its reliability. The sources and iterations of the survey and guided interviews are available in the appendix of the study. I have logged the initial outreach letters, the number of follow up contacts and the interview dates and results. I have spelled out the analysis of the qualitative and quantitative data (based on Garet, et al.'s 2001 analysis) in the analysis chapter. This "explicit description of the experimental treatment" (Mertens, 2009; p. 128) ensures the study's reliability—if another researcher conducted the same study, she should achieve similar results (Merriam, 2009; Yin, 2010).

Evaluating the factors principals consider when choosing professional development is a murky exploration in a field that already seems picked over—with little solid results. In a study where outcomes are not clear, using multiple sources of data to look for consistent results strengthens the study' internal validity (Merriam, 2009; Mertens, 2009; Stake, 1995; Yin, 2010). The large pool of potential survey respondents and the pool of six interviewees also strengthens this triangulation of data.

3.5.3 Generalizability

Participants in this study made up the whole pool of elementary principals of Title I schools served by the Allegheny Intermediate Unit in southwestern Pennsylvania. Title I schools face a common barrier of limited funding from a limited tax base, and face a common challenge to powerfully educate students coming from lower-income situations. The large percentage of this pool ensures the results may be generalizable to this population. Results relate to principals sharing characteristics with this group, including elementary school principals from other principals of Title I schools, other areas in Pennsylvania served by intermediate units, and other rustbelt cities.

Results may relate less to principals of secondary schools. The content and pedagogy in the variety of discrete subjects call for specific adult learning. This factor may present a limiter that will change the relationship between factors principals consider.

Results may also not generalize to principals who face different limiters. Principals of schools with more resources may choose different supports for their teachers. Principals in states with different intermediate support structures may have different access to experts and helpful programs. Those without strong unions may face different limiters in their decisions around teacher time.

One other unique resource to this pool of participants may limit generalizability. The principals and teachers in Allegheny County have access to a large number of universities and colleges, from top research universities to small liberal arts colleges. Though this is not an explicit factor included in the research, it may limit the generalizability of the results.

3.6 CONCLUSION

This mixed methods exploratory study investigated the question: what factors do principals consider when choosing professional development for teachers? It involved a survey and a targeted follow up interview to learn how principals view empirical research about professional development, how they view teacher agency and adult learning, and how the limiters principals face affects their decision-making. The potential participants were the principals in K-6 schools receiving Title I funding served by the Allegheny Intermediate Unit.

The survey and interview tools stem from published surveys in the literature and follow the advice of leading researchers in the field, including Merriam, Mertens, Stake, and Yin. The research project followed the University of Pittsburgh's IRB protocols, including security of data and protection of participants. The analysis of data also followed leading researchers' advice and drew on Garet et al.'s 2001 analysis as an example. Issues of external validity, internal validity and generalizability have also been addressed in preparation for the study.

4.0 SURVEY AND INTERVIEW DATA ANALYSIS

Chapter two of this paper outlines the findings from empirical research about what makes professional development for teachers have a positive affect on student learning outcomes. The concepts of engaged hours, duration, teacher engagement, collaboration, focus on content, focus on pedagogy and coherence to teacher and school goals were all explained and supported by empirical studies (Carpenter, et al., 1989; Cole, 1992; Duffy et al., 1986; Garet et al., 2010; Gersten et al., 2014; Marek & Methven, 1991; McCutchen et al., 2002; McGill-Franzen et al., 1999; Jacobs, et al., 2007; Perry & Lewis, 2011; Sample McMeeking et al., 2012; Saunders et al., 2009; Saxe et al., 2001; Sloan, 1993; Tienken, 2003; Yoon et al., 2007). These findings were also called into question by later studies that lacked teacher agency and did not align with adult learning theory (Garet et al., 2010; Gersten et al., 2014). The relationships between empirically based practices, teacher agency, adult learning theory and the limits principals face became the basis for the four questions this study explores:

a) How do principals view the body of empirical research that suggests best practices in professional development as they make decisions?
b) How do they view the concept of teacher agency in making decisions?
c) How do they consider the tenets of adult learning in their decision-making?
d) How do principals' limitations play into their decision-making?

This chapter details the data collection and analysis of this exploratory study.

4.1 SURVEY AND INTERVIEW DATA

This study ran in two phases. The first phase involved an on-line survey for quantitative data collection and analysis of that data. The analysis included standardizing the scores; finding the average responses for each participant, question and category; finding the standard deviations for each participant, question and category, and conducting six individual linear regressions to explore connections between the four research questions.

The second phase involved six guided interviews of principals in the participant pool. The questions were informed by the initial research and did not need modification based on the survey analysis. The interviews were recorded; transcribed; summary checked by the participants; coded for themes and analyzed for patterns with NVivo software. Some word counts also helped parse patterns, themes and connections illuminating the four research questions.

4.2 SURVEY DATA COLLECTION AND ANALYSIS

The first half of this chapter outlines the survey data collection and analysis to answer the four research questions. The survey specifically asked: a) How do principals incorporate the body of empirical research that suggests best practices in professional development? b) How strongly do they consider the concept of agency in making decisions? c) How do they consider the tenets of adult learning in their decision-making? d) How do principals' limitations play into their decision-making or how to they overcome them?

4.2.1 Survey data collection, response and completion rates

Of the 89 invitees, 23 principals responded, a response rate of 26%. This response rate is within an expected range for e-mail invitations to on-line surveys gathering research data from participants (Converse et al., 2008; Greenlaw and Brown-Welty, 2009; Lovell, 2009; Misra et al., 2012; Nulty, 2008; Soka, 2011).

Of the 23 respondents, 17 completed each question in the survey. Five participants ended their participation after answering demographic questions, and one participant read through the survey without responding. This yields a completion rate of 74%. A demographic description of the participants is in the figure below.

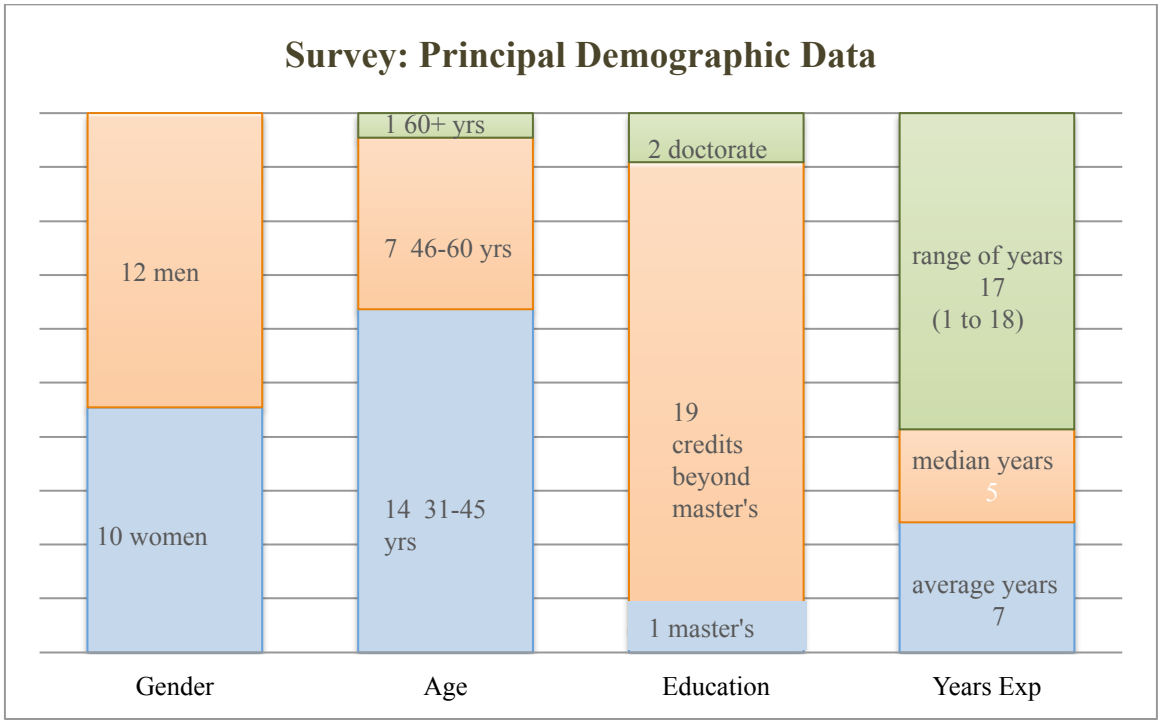

Figure 2. Survey participants' demographic data

The participant group was made up of 45% women and 55% men, similar to the potential participant pool's ratio of women to men (47%/53%). The majority of participants were between the ages of 31 and 45, with some credits beyond their master's degree. Most worked in schools in suburban areas, serving between 300 and 700 students, and most worked with student populations where less than a third of students were students of color. Fifteen of the 23 principals served student populations where more than a third of students were eligible for free and reduced lunch. These details fall in line with the aggregate description of the pool of potential participants (Pennsylvania Department of Education, 2017).

4.2.2 Survey data analysis: Average responses

The survey analysis began by standardizing responses to a five-point scale, with five the most positive response. Binary responses were marked yes=5 and no=1. Four level responses moved to the scale without a median of three. The responses were then separated into the four categories of research questions: use of empirically based practices; consideration of teacher agency; consideration of adult learning theory; effective approach to overcoming limiters. The mean response to each category and standard deviation is in figure 3.

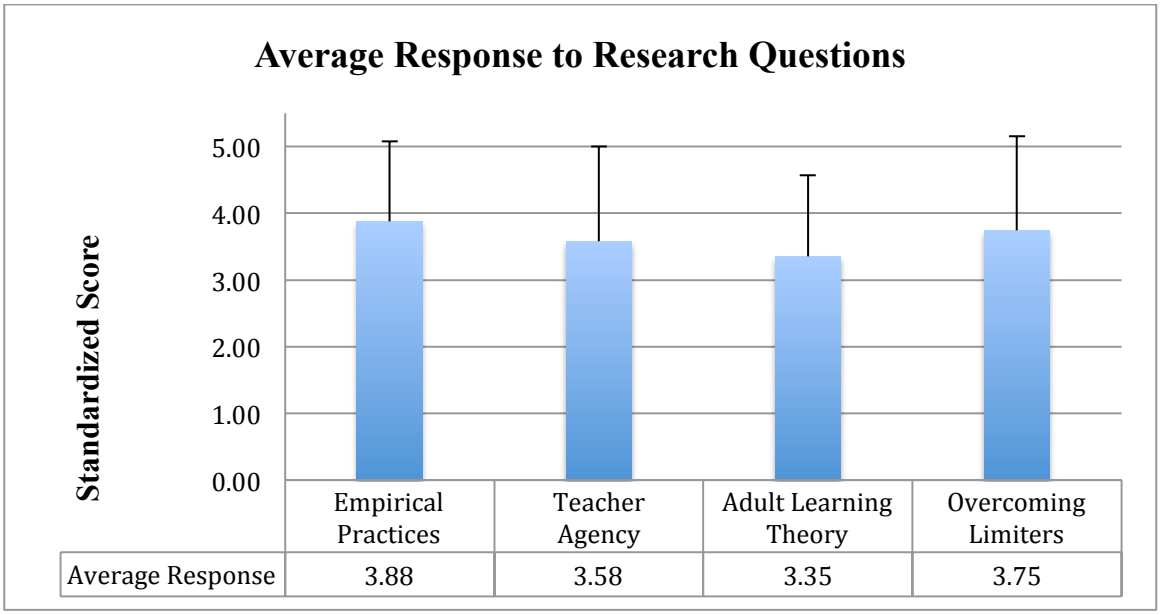

Figure 3. Average response for research questions

The average response was a 3.88 standardized response for use of empirical aspects, 3.58 score for considering teacher agency, 3.35 score for considering adult learning theory and a 3.75 score for overcoming limiters. This initial outcome offered several interesting threads.

Principals reported using empirically based practices more positively than any other aspect. They reported using regularly scheduled collaboration time (5.0), content focused professional development (4.76), common planning time for teachers (4.53), and at least ten minutes of peer observation (4.53). Garet (2010) suggests that these elements are all crucial for affecting student learning through professional development. Principals reported extended follow up (3.24) and university coursework (1.53) to be the least widely used practices. Yoon (2007) and others strongly suggest using the expert instruction university courses can provide (Garet, et al., 2001; Jaquith et al., 2010), but other resources, such as the intermediate unit, can provide expert instruction as well (Wei, et al., 2010). Follow up is strongly linked to adult learning theory (Knowles et al., 2011; Merriam & Bierema, 2014). Principals reported facilitating many

empirically supported practices that supported the school's goals and structure, but ensuring follow up did not receive the same priority. Arguably sustaining follow up is a difficult task, requiring forethought, budgeting, and a disciplined focus. Principals did report using ongoing programs (3.87), leaving the question of follow up, sustained programs and potential adult learning connections open for further analysis during the interview stage.

The lowest reported consideration was the use of adult learning theory. Principals did report facilitating workshops lead by their teachers (4.76). This teacher-led activity puts the teacher in a position to master the content so that they can teach it to their peers, a powerful task for the adult learner (Merriam & Bierema, 2014). It could also be a cost-saving measure, an idea that emerged from the principal interviews following the survey. Principals reported a moderate use of teacher evaluation to help provide targeted support (2.94). They reported less consideration of student assessments to help provide specific professional development for teachers (2.83) and even less facilitation of teacher-led learning, including action research, reflection and content study (2.60).

Principals reported a weaker consideration of teacher agency as well. They reported less teacher voice in determining the content of professional development (3.0), a sentiment echoed by the principal interviews. Principals also took teacher goals for their own growth into consideration (3.12) and allowed observational visits to other schools only moderately (3.12). Principals stated that they allowed teachers to work on their own research interests (4.53). Principals reported that they did not regularly facilitate teachers taking university classes (1.53) but they did facilitate reimbursing teachers for coursework to some degree (4.00). Though this question addresses the teacher's agency in taking courses, it also reflected established district policies—not necessarily principals' considerations about professional development for teachers. If this question were not included in the analysis, the mean rating for teacher agency drops to

3.47. Regardless, principals still facilitate the reimbursement and enable the professional development for their teachers, so this question was not omitted.

In addition to considering empirically supported practices, adult learning theory and teacher agency, principals must also work within and overcome their limiters. Principals reported positive responses to possible limiters, including having district supports for professional development including reimbursement for expenses (4.76), substitute teacher availability (4.76), and professional development days built into the school calendar (4.53). Other positive responses included the principal's control of teacher schedules (4.88), the freedom of principals to make decisions about professional development (4.06), curriculum and instruction (4.0), and budget decisions (3.89). Principals report a limited ability to provide stipends for work after hours (2.6), developing the curriculum (2.7) and determining professional development programs (2.6). These responses highlight the interaction between the district's policies and procedures and the principal's freedom and constraints. Both the exploration of the standard deviation of responses and the follow up interviews help clarify this tension.

4.2.3 Survey data analysis: Standard deviation

The standard deviation of the principals' responses revealed further information. Two categories showed less variance: consideration of empirical practices (1.20) and adult learning theory (1.21). Principals responded in less similar ways to the questions considering teacher agency (1.42) and overcoming limiters (1.41).

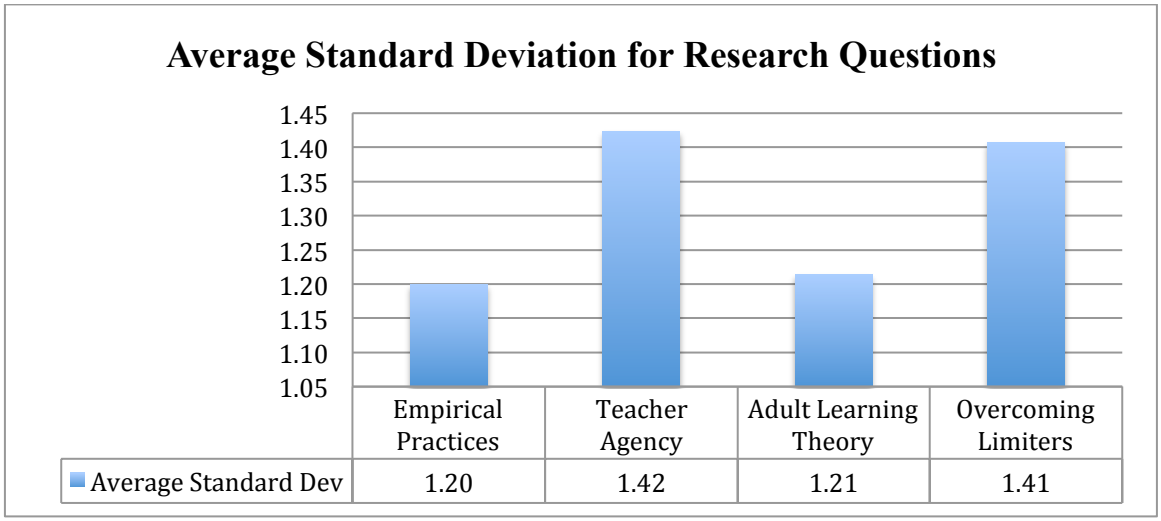

Figure 4. Average standard deviation for research questions

In general, the stronger a participant's average response in any category, the less variation showed between answers. Notably one participant showed zero variation in responses about facing limiters. Every response was a five. All other principals' standard deviations in limiter scores exceeded 1.1 points, with the highest standard deviation at 1.72 points.

Several questions in the limiter and teacher agency categories may have increased the average standard deviation, not because they showed differences in principals' considerations, but because they showed differences in the district policies that affected the programs principals could implement. "Observational visits to other schools" in considering teacher agency, and "stipend for professional development outside the school hours" and "early dismissal or late start for students" in the limiter questions had standard deviations of over two points (2.06, 2.03 and 2.06 respectively). These are all usually district policies involving finances and building schedules outside of a principal's purview. This opened the question of parsing differences in principals' primary concerns around professional development for teachers from differences in the actions they take because of district policies that constrain them.

By contrast, the questions with the smallest standard deviation seemed to fall within the building principal's jurisdiction, including "allow a teacher to participate in regularly scheduled collaboration with another teacher about instruction" which showed zero standard deviation; all principals reported the strongest measure for this tool. Implementing professional development that supported the "school improvement goals" also yielded a low standard deviation of 0.56. In the adult learning theory bank, the question about programs "planned by teachers in the school or district" showed only 0.70 points of deviation. Again, this is a policy likely controlled solely by the principal, informing the interview questions for the next phase of research.

4.2.4 Survey data analysis: Simple linear regression to see connections

The average scored response and standard deviations for questions showed how positively principals reported considering each of the four research questions, but they did not show the relationship between one research question response and another. To shed some light on this, a linear regression between each of the four categories was conducted. (This concept was informed directly by Garet et al.'s [2001] study of features of effective professional development, simplified for correlation, not causality. The Pearson correlation coefficient, or *r*-value is a common measurement for correlation in social science research [Walk & Rupp, 2010].) The outcome of these six simple linear regressions is modeled in figure 5.

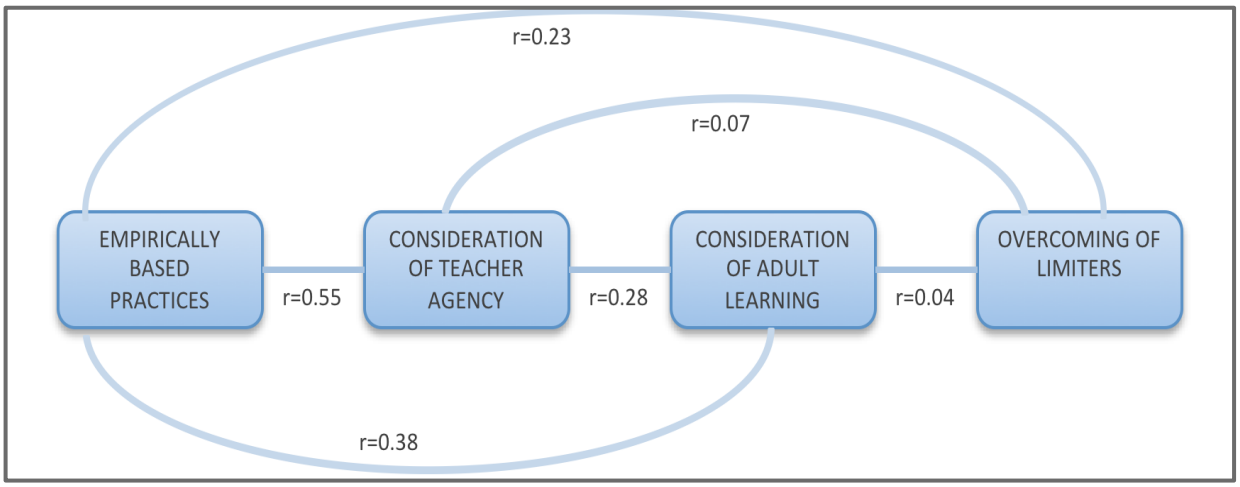

Figure 5. Correlation coefficients model for four research questions

The relationship between the consideration of teacher agency and the overcoming of limiters (r=0.04) was statistically not significant, neither was the correlational coefficient between limiters and teacher agency (r=0.07). The principals' score on limiters correlated mildly to the principals' reported consideration of empirical practices (r=0.23). Limiters, then, did not seem to have a powerful affect on the other factors principals were considering.

Consideration of adult learning correlated weakly to consideration of teacher agency (r=0.28). That correlation was stronger between adult learning theory considerations and empirically based practices (r=0.38). Within empirically based practices, principals reported a very strong use of collaboration (5.0), peer observation (4.53) and common planning time (4.53). These three practices also align with principles of adult learning theory (Knowles, et al., 2012). This alignment may be one reason for the strength of the correlation, though the two categories have twenty-two questions between them. This curiosity informed some of the work in the follow up interviews.

The strongest correlation of factors principals consider was between empirically based practices and teacher agency (r=0.55). The principals' score for the consideration of empirically based practices moderately correlated to their score for consideration of teacher agency. These two research questions share five questions in the survey. The questions ask about observational visits to other schools (3.12), peer observation (4.53), research on a topic of the teacher's interest (4.12), regular collaboration (3.13) and full or partial college tuition reimbursement (4). The survey contained five questions exploring the consideration of teacher agency and sixteen questions about empirical practices, so having five questions that could apply to either category may help strengthen the correlation. This is another connection that informed analysis of the interviews.

4.3 INTERVIEW PARTICIPANTS

The six interviewees included four women and two men who had served as administrators from two years to 18 years. Three participants had earned doctorate degrees in education, a demographic that skews the interview pool away from the ratio in the participant pool toward doctorate level participants. Though the principals who were invited matched the ratio more closely, doctorate level participants agreed to the interview. Two principals served in K-2 buildings, one in a 3-5 upper elementary building, one in a K-4 building and two principals served in K-5 buildings.

4.4 INTERVIEW ANALYSIS: FOUR RESEARCH QUESTIONS

The six transcripts were edited to eliminate identifying information, coded for themes, phrases and information relating specifically to the four primary research questions: a) how do principals view the body of empirical research that suggests best practices in professional development as they make decisions? b) How do they view the concept of agency in making decisions? c) How do they consider the tenets of adult learning in their decision-making? d) How do principals' limitations play into their decision-making? This section provides a summary of interview answers to these four research questions.

4.4.1 Four research questions: Empirically based practices

Principals reported using a majority of the seven empirically based practices enumerated in chapter two. Table 3 provides an overview of their responses.

PRINCIPALS' REPORTED CONSIDERATIONS ABOUT FINDINGS FROM STUDIES MEETING WWC STANDARDS	
ENGAGED HOURS: MINIMUM 14	Principals reported approximately 8-12 hours within Act 80 days for their use, plus 4-6 hours throughout the school year.
TIME SPAN: AT LEAST 1 SEMESTER	Principals reported some PD focus that lasted longer than a semester with mostly informal follow up due to resource constraints.
ACTIVE ENGAGEMENT	Principals regarded active engagement as a top priority for teacher professional development.
COLLABORATION	Collaboration through teacher-lead training and grade level or department meetings was a common theme.
FOCUS ON CONTENT: TEACHER UNDERSTANDING	ELA, math and technology professional development were common, though improving teacher understanding of the content in ELA and math was not explicit.
FOCUS ON PEDAGOGY: HOW STUDENTS LEARN	Principals did not report programs focused on how students learn specific content.
COHERENCE: TEACHER AND SCHOOL	Principals described a balance between state, district and building goals. They wanted coherence with PD and teachers' daily work. A third of principals explicitly described teacher goals.

Table 3. Principals' reported use of empirically based practices

No principal mentioned making research- or evidence-based programs a priority, though every principal reported considering some empirically supported practice in their decisions about professional development. The idea of wanting active engagement emerged as the strongest theme among the principals. All six principals stressed that professional development must be "pretty active," "engaging," or "as interactive as possible," and all talked about active engagement as part of their non-negotiable criteria for choosing specific programs. Other common themes included a focus that lasted longer than a semester, implicit collaboration, ELA and math content focus, programs that teach teachers in the manner they want them to teach

students, and alignment between state, district and school goals. This section outlines these seven aspects in detail.

4.4.1.1 Empirically based practices: Engaged hours

"We do not have enough professional development. I don't know anyone who does, really." ~Principal 1

Principals reported the amount of time they had available for professional development activities as a limiting factor. Explicitly, one principal reported having twelve hours built into his calendar through Act 80 legislation and his teachers' union agreement. Several talked about hours within the days built into the beginning of the calendar year. District initiatives and professional development took most of those days, leaving the building principals several hours to use for professional development facilitation.

Several principals described an overall building focus developed in the summer stemming from district goals, these included fifth grade math, MTSS Tier 2 cohorts and Tier 3 case studies (both year-long projects through the state) and data binders. Others described larger initiatives over several years in writing for all elementary grades. Against these plans, other needs arose throughout the year, including new curricular materials, emerging safety issues for the district, changing technological platforms and responses to changes in district level administration. Other districts responded to shifting movements in education, bringing in well-known speakers to address current issues such as personalized learning, maker spaces and STEM curriculum. These needs and speakers held value for the district, but did not necessarily align with the principals' original focus.

Principals described having at least 14 hours for professional development. They described a focus for which they intended to use those hours at the start of the school year. They

also outlined a series of emergent needs and issues that competed for resources for professional development time. Overall, principals expressed that time was one of the fiercest limiters for their effective professional development implementation.

4.4.1.2 Empirically based practices: Time span

"...that's what happens, unless there's really almost formal follow up... and dedicate more time to it, it usually does not stick." ~Principal 2

Studies considering the duration of effective professional development programs support this intuitive understanding that adults need months of learning to absorb and use the skills and knowledge in professional development programs (Cole, 1992; Duffy et al., 1986; Garet et al., 2010; Marek & Methven, 1991; McCutchen et al., 2002; McGill-Franzen et al., 1999; Jacobs, et al., 2007; Perry & Lewis, 2011; Sample McMeeking et al., 2012; Saunders et al., 2009; Saxe et al., 2001). Adult learning theory supports this understanding as well (Knowles et al., 2011; Merriam & Bierema, 2014).

Throughout the study, principals echoed Principal 2's statement that a program needs almost formal follow up and reiteration throughout the school year. Principals primarily addressed this through faculty meeting time, grade level meeting time or individual conversations with their teachers over data binders or project based learning products. Principals acknowledged the need for months of attention to one topic, but pointed to time constraints and emergent issues as barriers to focused, formal follow up.

4.4.1.3 Empirically based practices: Active engagement

"I want it to be highly interactive. I don't like when we have people come in and lecture to the teachers about not lecturing." ~Principal 1

All six principals stressed the need for professional engagement for teacher to be active and engaging. They described active engagement as a form of collaboration and pedagogical instruction; an answer to immediate needs and an activity that aligns with the teachers' values.

Principal 6 described professional development to help teachers use an on-line assessment for student growth. The cost of bringing a trainer into school was prohibitive, but he did not want to ask teachers to simply click a link or view a webinar. He wanted them to be able to ask questions and give feedback, and make it "as interactive as it can be for someone being in a different state." He used group phone conferences to help teachers with this platform. Principal 1 also wanted teachers working together actively in professional development activities. She described the need for teachers to "be hands on and answer questions and moving around" as they learn together. The principals described this interactive group learning as a top priority for their programs.

Principals also expressed the belief that presenters should lead programs for teachers the way they want the teachers to lead the students in the classroom. Principal 4 said, "If we wouldn't teach our children in that manner, then we shouldn't be receiving professional development in that manner. I always feel very strongly about that."

One need principals saw was that the professional development sessions should give teachers something they can use the next day in the classrooms. Several principals gave examples: teachers posting objectives in the classroom, using interactive white board technology or beginning social media accounts as a grade level after one session of professional development. Principal 6 mentioned that professional development in the summer might address "more philosophical things, like whole child" ideas, but that during the school year he looks "for things that are practical, that are going to engage the teachers and then impact instruction, or at least something they can take back and then use in the classroom almost immediately."

Principals also wanted to use professional development activities that aligned with teacher values. They mentioned wanting teachers to find that "it's meaningful. It's purposeful. And it's easily actionable." Principal 3 said, "when we focus on the impact it's going to have on students, you really maximize teacher engagement."

4.4.1.4 Empirically based practices: Collaboration

"I want something where the teachers are interacting with each other..." ~Principal 6

Grade level meetings, faculty meetings, teacher-led sessions and ongoing group projects were all part of the principals' descriptions of their professional development. The meetings were already built into the teachers' schedules, and principals used them to share ideas, brainstorm or ask questions of each other. The teacher-led sessions happened during these meetings when teachers brought back ideas and skills they had learned outside of the school and shared the information with their peers.

Five of the six principals described professional development where they had teachers go out and share what they had learned with the staff. They worked with their staff to decide whom to send, when the teachers could share, and how they would follow up. Two principals talked about arranging planning time or financial incentives to teachers to prepare their teaching of their peers. Several emphasized the buy-in these sessions enjoyed, as teachers listened and participated well with peers.

Principals described teachers working in groups on projects, including implementing new writing and math curriculum and working with project-based learning. Two principals described the groups coming back to the principal with questions or concerns that helped the principal plan for the next meeting. Principal 2 described a collaborative learning effort that her teachers lead as a climate initiative. She said:

> We were having some attendance issues. So a group of teachers in the summer we created a positive attendance support program. And, so they were really engaged. They found some things on the Internet. They came in. We created perfect attendance certificates for every month out of the year. We created these really warm letters that went out at the beginning of the year for people who didn't do such a good job last year, providing them support.

Though the teachers were not focused on professional development, they learned truancy elimination strategies together and implemented them for the school. Their principal found their collaboration key in their active learning.

4.4.1.5 Empirically based practices: Focus on content; teacher understanding

"We're trying to implement [a new math program] right now as an example, and it's not real smooth...we are trying to regroup, and say how can we have a better PD..." Principal 5

All principals talked about addressing some content from three areas: English language arts, math, and technology. Two principals described project-based-learning initiatives, maker spaces and tinker labs. One principal addressed cultural education. One reported using an anti-bullying curriculum. One principal described implementing a new math program and two discussed longer term writing curriculum and instruction.

In the interviews, no discussion of teacher understanding of math (e.g. number sense or logical thinking [Garet et al., 2010; Sample McMeeking et al.,]) was discussed. Teacher understanding of writing different kinds of texts and text data analysis (TDA) did emerge in two principals' interviews. All principals addressed some understanding of technology, including using Minecraft, Twitter, and SmartBoard technology used by the teacher. One principal described a social studies project-based-learning product built by a third grade student in

Minecraft after a teacher participated in a professional development session demonstrating Minecraft as a useful pedagogical tool.

Other content focuses principals reported were diversity trainings for teachers, safety trainings, and functional behavior assessment trainings. Teachers also worked on multi-tiered-systems of support (MTSS) projects exploring current instruction and interventions in a single content area in a building.

4.4.1.6 Empirically based practices: Focus on pedagogy—how students learn

"We're noticing the kids are experiencing more difficulty when they're working with the grammar, or with the phonics. How do we tackle that?" ~Principal 4

No principal explicitly discussed professional development aimed at helping teachers learn how students learn certain content. Three interviews contained references to addressing problems in writing with curricular materials and one interview referenced implementation of a new math curricular program.

Principals expressed the need to provide teachers quickly useable tools during the school year. Programs teaching teachers how students learn specific content did not emerge in conversations about the current professional development in the participants' schools.

4.4.1.7 Empirically based practices: Coherence with teacher and school goals

"You have national standard, then you have a state standard, and then we try to align what the teachers' goals are...and somehow we try to fit that in." ~Principal 5

Principals described a balance between state, district and building goals. Five of the six principals reported regularly working with their district leaders to build an annual professional

development plan for their buildings based on state mandates and district goals. One principal reported minimal input into the building goals, but was sometimes consulted.

In the programs they were able to facilitate, all principals expressed the desire to make the professional development relate directly to a teacher's work as much as possible. When goals from the state or district (such as standardized testing tutorials or state mandated reporter training) demanded teacher time, several principals described creative ways to continue building level goals for teacher learning, including using emails to disseminate information instead of meeting times and working with teacher unions to provide time off-hours for online training in return professional development time in the building.

Three of the six principals explicitly mentioned teachers' own professional goals. One principal uses Sullivan and Glanz's (2013) supervision based on the teacher's needs. He asks veteran teachers to create a personal professional goal, and helps teachers who are newer to create an appropriate one. These principals spoke of ensuring that the teacher goals are aligned with building goals through Pennsylvania's teacher supervision rubric. With this alignment, principals expressed confidence that the professional development for the building and the teacher's individual supervision was sufficient to help teachers grow.

4.4.2 Four research questions: Teacher agency

> *If you don't have good PD, they really loose motivation and they're not learning. Teachers need to learn, too. They're people who are active and they want to be involved in maximizing the time they have with children when they are learning, teaching and learning. ~Principal 5*

In the principal survey, participants scored highest in considering the empirical aspects of professional development that research suggest make it effective for promoting student learning. They scored next to lowest in considering teacher agency. This dichotomy is especially concerning considering Garet et al.'s 2010 study that suggested empirically supported practice were not enough to make professional development effective. Without the freedom to initiate, collaborate and take hold of the learning, teachers could still miss the knowledge and skills programs attempt to offer.

Their responses suggest that principals moderately consider teacher voice in selecting professional development programs; they call on teachers to lead each other and they encourage teachers to research topics of their own interest professionally. All six principals reported seeking feedback or using surveys to hear what teachers thought was needed for professional development programs. Several principals reported having teacher representatives on a district committee for deciding programs, or as part of their building level decision making group. Four principals reported asking teachers to go to professional development and come back and teach their peers; two reported having groups of teachers lead instructional work in English language arts and math, including asking for professional development support for themselves and their peers. Four principals encouraged teachers explore and share about their own topics of interest, and one principal formalized this process in through asking his teachers to create their goals. These three avenues: teacher choice in programs, teacher leadership and independent teacher work demonstrated an appreciation of teacher voice. Principals also reported another perspective.

One principal talked about some of his trusted teachers giving him advice about programs saying, "We'll use them and utilize them and see what their thoughts are and how best to approach it. So, teachers have a voice." Another principal expressed frustration with some staff saying, "If they don't come back to share, are not willing to share with others, then the non-

negotiable is you're on your own to learn it or be responsible for it." Both colleagues expressed valid thoughts: teachers' opinions can help shape effective programs; and teachers are responsible for following through with their commitments in professional development. In both statements, the principals described acting on the teacher in some way, not with the teacher as a professional colleague.

One principal described shifting that center of action from himself to the whole staff. He said, "we have for the past few years, six or seven, had courses with open ended writing, both in response to questions and also narrative, persuasive, those types of things. We've focused a lot of professional development time to developing that K-6 model that everyone is responsible for a piece of the pie." In addressing his teachers' goals, he said:

> I asked my teachers as part of the professional learning community time to work on a goal for the year. We called it a personal professional goal. A few people I told them what they should do. A lot of people jumped at the opportunity to do something different. ... They have a thirty minute block each month to report on it, to work on it, and they can meet with other teachers; we've set some meetings up with our technology coordinator and different things like that to help those teachers. That was one way I wanted to give the teachers an opportunity to do something and work on something.

This real-world example of fostering teacher growth is what policy makers have asked for (TNTP, 20150), and instead of offering monetary incentives or acknowledgements, this principal asked teachers to do what they wanted to do in the first place and grow as professionals.

4.4.3 Four research questions: Adult learning theory

> *It might sound wonderful on a piece of paper, but I need the teachers to be able to feel like it's meaningful to them and the work that they're going to be doing with their students. And are they able to walk away with something in their hand that they can then implement with their students the next day if they wanted to. ~Principal 4*

In her statement, Principal 4 enumerated several principles of adult learning theory: adult learners need resources they can immediately use, experiences directly related to their daily lives and problems they regularly face, and motivation to put their learning into practice. Adult learners also need to know the purpose behind a concept, what it looks like and how to use it, and they need the opportunity to manage and direct how they learn (Knowles et al., 2011; Merriam & Bierema, 2014). Of the four research questions, principals ranked adult learning as the lowest consideration in the survey with very little standard deviation between principals. In the interviews, some of the story behind this emerged in two consistent practices: the use of teacher-lead professional development and the lack of teacher-led efforts to improve instruction.

The five principals who reported facilitating teacher-lead professional development provided resources to support the teacher's learning and teaching of the other staff. The principals also allowed the teacher to take the helm in their project and supported the teacher-leader. This practice is a concrete example of adult learning theory in action. The principals reported its success for the teacher and the staff, and demonstrated their belief in that by putting it to use regularly.

One principal reported facilitating teacher-led efforts to improve instruction. This principal described a "literacy committee" in his school, focused on seeing how students are

growing in reading and writing and how teachers can change their instruction to meet student needs. This committee offers suggestions and requests to the principal for upcoming professional development and regularly tracks student-learning outcomes to see how instruction is working. This use of teacher-lead efforts allows the principal to provide resources and give direction while still regarding teachers as professionals, accountable for resolving specific problems of practice (Gunzenhauser, 2012; Heifetz, 1994). Within the group of principals, this activity was unique.

The other five principals described directing their teachers' learning. Several principals voiced skepticism for teachers' ability to direct their own learning. One principal stated, "They don't know what they don't know," when describing his choices for professional development. Another stated, "Some teachers want to grow and some teachers don't want to grow," about teachers' motivation. The principals both spoke highly of their teachers, but did not express trust in all teachers to grow without explicit direction for their own learning. The question of how much direction and support teachers need seems unanswered among the interviewees.

Principals reported that they did not often use evaluations or student data to target instruction for individual teachers—a practice that may be impractical given most principals' current evaluation structures. They did report relying on teacher surveys and conversations with teachers about interests and needs the teachers saw to help them make decisions for teacher's learning experiences. Principal 4 explained,

> If I'm having an individual teacher meeting and I'm starting to notice a trend in those conversations, you know, across the board, I have to think, "okay what do we need here?" We're noticing something that needs a little bit of focus. You know, taking that into consideration. We do some surveys at different times just to see what initiatives or things we might want to work on, whether it be at the grade level or at the whole building and sometimes district wide.

Most principals saw this as part of their relationship with their teachers—their ability to listen and provide what teachers needed.

The participants all considered teachers' need for life-related, problem-centered professional development that offered teachers resources to use in their daily practice. Principals attempted to get "buy in" and make sure their teachers were motivated, but did not release responsibility for directing the learning to their teachers. Allowing teachers the responsibility for their own growth was not a current practice, though principals described other tenets of adult learning theory in consideration of professional development for teachers.

4.4.4 Four research questions: Overcoming limiters

"I think there are many of us in the education field are trying to survive the day." ~*Principal 3*

On the principals' survey, participants expressed a very positive perception of their ability to overcome possible limiters (second only to their consideration of empirical practices). Their responses in the interviews supported this perception, at least from a reactive position. Principals also expressed the need for clearer priorities and focus in allocating resources for professional development.

Principals reported that the primary limiters were time and money. Principal 3 clarified that "money isn't always just cash, it's people's time and things like that." All six participants described creative ways they had navigated these limiters, including turning staff meetings into professional development sessions and communicating information electronically; allowing teachers to rearrange their in-service time to give them time away from school to meet state mandated training and time in school for professional development, and paying for teachers to go

to a training and come back to present, including allowing time or compensation for them to prepare the presentation. Several principals' districts spent funds to bring in experts as well, and principals discussed attempting to follow up with those one-day sessions during their faculty and grade level meeting times. Principal 5 explained:

> If we have to punt, we'll go back and take one of our department heads, or someone really strong in that content area, or topic of need, let's say somebody who does a flipped classroom, or somebody who really excels with the technology in their classroom. We'll tap into our own resources. One, it's cheaper. You can compensate a teacher with either release time and /or act 48. But we have to sort of tap into our own family here to make it worthwhile.

Teacher buy-in was a limiter to some degree for principals. One principal established a walk-through sheet with no formal power to help teachers learn to write their objectives on the board for the students. Though some teachers gave him push back initially, one teacher came back and told him that the students had pointed out a day when the teacher had forgotten, and acknowledged that it did help the students learn. Other principals used teacher leaders, anonymous surveys and conversations with teachers to win them over to an initiative.

State and district mandates also limited the time and resources principals had to use for professional development. Five of the principals reported having some voice in district decisions about their teachers' learning. Principal 4 explained that "if it's mandated, that it's something that you just have to do. But we want to do it in the most succinct way so that we have time for the other initiatives and things that need to be covered." Principal 1 explained it though a familiar parable:

> The professor puts the rocks in the jar, and then the pebbles and then the sand, well, I guess the state and federal initiatives are the rocks, and they take up a lot

> of space, and those are the ones you have to put in first. And then what the district wants to do would be the pebbles, and then you put those in, and then you try to, if there's any room left in their brains or in the time, then you try to sprinkle the sand in.

The balance between their teachers' professional growth and the district and state initiatives was one clear driver of the limits principals faced.

Several principals explained that circumstances had arisen in their district and communities that had forced them to shift their focus from their goal for the fall to goal reflecting current needs and emergent situations. They did not express this as positive, but as a necessary response. One principal in this group also talked about his teacher-led professional development in writing that continued in spite of the shift from the district level. This initiative stood out: in the midst of changing goals from above, the teachers' collaborative work to improve their writing instruction continued, and their principal supported it.

With all of these limiters, principals reported finding creative ways to help their teachers stay invested and help their students continue to grow. This creativity was primarily reactive, though every principal described the plans they had made for professional development in the summer. One principal said simply, "to be perfectly honest, I don't feel that we have a laser like focus on professional development, and that it's hit or miss." With all the work principals are putting toward helping their teachers grow, principals and teachers should see a return on this investment (TNTP, 2015). They have demonstrated the creativity and competence. The next chapter will suggest implications of these interviews and surveys that may help principals not just survive the day but help their students and teachers thrive.

4.5 SURVEY AND INTERVIEW CONNECTIONS

The interviews addressed several questions raised by the survey results concerning empirically based practices, teacher agency-adult learning connection, and limiters.

Principals' responses to the survey suggested that they did consider best practices suggested by empirical studies, but did not rate their facilitation of follow up very highly. The interview results showed that this is a frustration for many principals: they would like to follow up with more initiatives, but find themselves required to shift according to district mandates or emergent needs.

Principals also reported a strong consideration of teacher engagement but a lower consideration for teacher agency or adult learning theory. In the interviews, principals described wanting teachers to walk away with a ready tool after an engaging session, not necessarily a ready path for professional growth. Principals also discussed listening to teachers about what learning they needed, but did not allow teachers a strong role in making the decisions about professional development. A strong consideration for empirical practices and for teachers' voice did not ensure meeting adults' needs for ongoing learning and for a release of agency to the teacher as a professional.

In the survey principals discussed issues of limits that the interviews illuminated. The survey results showed most a strong use of teacher-lead professional development sessions (though teachers did not have much say in choosing programs). The interviews showed this to be a cost-cutting measure in many districts, allowing a teacher to go and bring back the information to the group. The survey also showed a large standard deviation in the principals' freedom to choose the programs—a point reflected in the interviews as principals discussed navigating varying degrees of voice in their own programs.

4.6 DATA COLLECTION AND ANALYSIS CONCLUSION

This chapter describes a two-part study involving participants from a pool of 89 school leaders in Title 1 elementary schools served by the Allegheny Intermediate Unit. The first phase of the study involves a 54-question survey asking about demographics and about the four research questions exploring how principals consider empirically based research, teacher agency, adult learning theory and limiters in their decisions about professional development. Of the group, 23 principals responded and 17 completed the survey. The second phase of the study involves a 10-question guided phone interview with six principals. Quantitative and qualitative data were analyzed for common approaches, variance, relationship between the four research questions and the principals' stories behind them.

Principals report a strong consideration for empirically based practices and effective strategies to navigate limiters. Principals report a weaker consideration for teacher agency and adult learning theory. This finding echoes a pivotal study (Garet et al., 2010) suggesting that employing empirical practices is not enough to make professional development effective. Garet et al. (2010) did not facilitate avenues for teacher agency in their study, and did not follow tenets of adult learning theory. The programs they researched did not improve student learning.

The following chapter analyzes these findings, acknowledges limitations of the study and explores the study's implications on practice, policy and further research.

5.0 IMPLICATIONS FOR PRACTICE, POLICY AND FURTHER RESEARCH

This chapter summarizes the findings of the study through the four research questions and a summary analysis. It acknowledges limitations in the study and suggests implications for practice, policy and future research in principals' decisions about professional development for teachers.

5.1 PRINCIPAL AS PROFESSIONAL AMONG PROFESSIONALS

I began this study focused on the principal's placement in the school system to facilitate professional development for teachers that would nurture deeper learning in the school. I wondered if principals knew what empirically supported practices would foster growth among the teachers that would affect student learning, so I searched the literature to see what those were. I found that these practices are not enough: we also must consider the agency of the teacher as a professional and her needs as an adult learner if we are to see our student learning improve. I wonder if the lens of a professional among professionals will help principals who are intent on helping their teachers grow.

Principals in the study did report using many of the practices suggested by literature, and yet they did not report helping teachers learn the way that students learn, the pedagogy of a concept. This practice could be the one that most requires teacher agency—putting the teacher in

the role of the learner and asking her to find a way to help her students learn. Principals also reported taking surveys and asking teachers their preferences and then making the decision themselves. Only a few collaborated with the teachers to find what the teachers needed and help them meet those needs.

I suggest the principal step onto the level of the teacher as an equal professional with a different role to facilitate the strongest teacher growth. The principal who works with colleagues to choose programs could use student learning data, including tests, projects, rubric-evaluated work, instructional conversations, and uncommon measures. With the teachers and principals using student learning as their guide, they could select programs to meet their students current needs, which may well reflect the learning needs of the adults in the building. Some principals in this study (e.g. Principal 3) discussed this kind of collaboration already happening in their schools. I suggest that this perspective can help move a school into a professional learning organization that provides our students the highest quality learning environments for their growth. A lack of this perspective can confuse engagement with agency and asking for input with collaborative decision-making based on student learning.

5.2 HOW PRINCIPALS CONSIDER EMPIRICAL RESEARCH

5.2.1 Engaged hours: Minimum of fourteen

Principals facilitated professional development that used the practices supported by empirical research consistently, though not completely. Principals consistently reported using 14 or more hours for professional development activities. They reported sometimes dividing that time

between competing needs. This amount of time could positively affect student-learning outcomes if these hours were invested in one program of professional development (Gersten, et al., 2014; Yoon et al., 2007). The question of what goal or long-term focus principals have for these hours stood out from the interviews.

5.2.2 Time span: at least a semester

Principals reported sustaining a focus (not a program) for longer than a semester. Some principals included focusing on writing for several years. Others discussed training teachers on new materials. The idea of proactive planning and work stands out in the principals' responses. They report a long enough time span that the program could affect student learning if all other pieces were in place. Without the "laser-like focus" one principal described missing, this resource could be unhelpful.

5.2.3 Active engagement

Principals reported multiple examples of active engagement for teachers, a consideration strongly supported by principals' intuition and empirical research (Marek & Methven, 1991; McCutchen et al., 2002; Saxe et al., 2001). These examples all included ways to give teachers something useful to use in their classrooms the next day. Several stories emerged from this question that described the teachers taking the tool they had gained and using it to create something new with students. The difference between engaging activities and releasing the responsibility for learning to the teachers did not emerge in the interviews. It may be useful to explore this further and see how principals consider engagement vs. agency.

5.2.4 Teacher collaboration

Principals reported considering teacher collaboration in several ways, including facilitating regular discussion and sharing in meetings, facilitating teachers helping each other learn, and supporting teachers working together on curricular content. As adult learners, collaboration with others is one of the most powerful ways for teachers to learn. Working with teachers to create a goal for collaborative work may help make this more useful for nurturing teacher growth.

5.2.5 Focus on content: Teacher understanding

Teacher learning often focused on English language arts, math or technological content. Principals reported that this learning depended heavily on the curricular materials and sometimes focused on use of those materials instead of content. One principal described focusing on deeper concepts as not helpful during the school year because it would not give teachers a tool to take with them. The idea that immediate concepts were far more valuable (or accessible during professional development time) was not challenged in the interviews. Instead, immediately useable information was prized, making curricular materials especially important. The question of teacher growth was not addressed. The teachers' use of tools was clearly valued in the principals' discussions.

5.2.6 Focus on pedagogy: how students learn

This consideration did not emerge in conversations about the current professional development in the participants' schools. It may have been implicit in their discussions of content focused learning, or it may have been a practice that principals did not consider. Incorporating this aspect

into professional development programs yielded powerful results in the literature (Gersten et al., 2014; Jacobs, et al., 2007; Perry & Lewis, 2011; Saxe et al., 2001; Tienken, 2003). Studies about professional development on pedagogy included having the teachers learn content the same way their students would learn it. This kind of professional development requires a deep understanding of how students learn, and a careful plan of how to help teachers experience this. It may be that principals did not consider pedagogy a needed focus, or that the planning and time were too resource intensive for principals to use. It may also be that principals may not understand what this kind of professional development is or how to facilitate it.

5.2.7 Coherence: Teacher and school

Principals did not report commonly implementing professional development programs that cohered to teacher goals; principals did listen to teachers' voices when choosing programs. Professional development programs were selected and implemented to meet the school goals for student learning. The tension between a program that meets a teacher's individual goal and the school's goals did not emerge in the conversation. Instead, principals seemed to see school goals as the driving goals for professional development programs while considering teacher goals in their evaluation of teachers.

5.2.8 How principals consider teacher agency

Principals reported moderately considering teacher agency in choosing professional development programs. All participants discussed using teacher feedback or survey results to decide on programs, and two reported having teacher representatives on selection committees. Two

principals mentioned having a team of teachers working on instructional improvements, and one principal described the importance of the group's work in letting him know what learning the teachers needed to help students grow. Four principals formally encouraged their teachers to independently select individual professional development opportunities for themselves. These programs dependent on teacher agency included some of the group.

One principal talked about some of his trusted teachers giving him advice about programs saying, "We'll use them and utilize them and see what their thoughts are and how best to approach it. So, teachers have a voice." Another teacher expressed frustration with some staff saying, "If they don't come back to share, are not willing to share with others, then the non-negotiable is you're on your own to learn it or be responsible for it." Both colleagues expressed valid thoughts: teachers' opinions can help shape effective programs; and teachers are responsible for following through with their commitments in professional development. The troubling part of their approach is that in both statements, the principals described acting on the teacher in some way, not with the teacher as a professional colleague.

For a principal to consider the agency of a teacher in her own growth, the principal has to work *with* the teacher and not *for* the teacher in a posture of mutual accountability (Gunzenhauser, 2012; Strike, 2007). I suggest that the principal could see the teacher as an equal professional with a different role and a different outlook. The teacher knows what she sees in the classroom every day and has some expertise about her students' learning that the principal cannot have, simply because the principal is not teaching those children every day. By asking the teacher to take an equal part in the decision about professional development, the principal asks the teacher to stand with her as a professional and not merely follow the principal's directive.

This puts the onus for growth on the teacher, leaving the principal to provide resources and help the teacher consider how her goals are coherent with the school and state goals, or how

they differ (Heifetz, 1999). It allows the teacher the freedom to choose her path for growth and asks the teacher to take the initiative for learning (Jacobs, et al., 2007; Marek & Methven, 1991; McCutchen et al., 2002; Perry & Lewis, 2011; Saxe et al., 2001). This posture may foster the mutual responsibility needed for student growth, and may foster the professional growth they hope to see in their teachers (Greene, 1997; Gunzenhauser, 2012; Strike, 2007).

5.2.9 How principals consider adult learning

Of the four factors evaluated in this exploratory study, principals reported considering adult learning least often. The interviews showed that principals consistently focused on two tenets of adult learning theory: the need for active engagement, and for learning to be directly related to what the teacher would do in the classroom. Principals also regularly called on teachers to go out to a professional development workshop and come back as a teacher for the rest of the staff. This active, teacher-led professional development met some adult learning needs (Knowles et al., 2011; Merriam & Bierema, 2014).

One principal reported that "a lot of people jumped at the opportunity" to come up with their own goals for the year. This real-world example of fostering teacher growth is what policy makers have asked for (TNTP, 20150), but instead of offering monetary incentives or acknowledgements, this principal asked teachers to do what they wanted to do in the first place and grow as professionals. Greene (1997), Garman and Holland (2015) and Gunzenhauser (2012) suggest that this release of agency to the teachers is essential. Garet et al.'s (2010) pivotal, unsuccessful study with all empirically based practices and very little teacher agency supports this idea. Adult learning theorists suggest this internal motivation to work for one's own goals crucial for adult learning (Knowles et al., 2011; Merriam & Bierema, 2014).

Only one principal in the study directly shared the responsibility for choosing what professional development the teachers would have. This did not allow most teachers the chance to participate in directing their own learning, and may not have let them understand why the learning mattered. Without knowing and accepting why a program is needed, teacher motivation may suffer (Merriam & Bierema, 2014).

5.2.10 How principals consider limiters

Principals reported considering how to overcome limiters as the second strongest factor in making decisions about professional development for teachers. The limits principals reported in interviews included time and money constraints, teacher buy-in, state and district mandates (which require time and money), and emergent issues. Principals reported novel, creative strategies to navigate these limiters, leaning on teachers to provide peer-instruction, rearranging schedules and working with unions to free teachers for professional development opportunities.

In all of these responses, principals reacted competently to the situations that arose, but this sometimes resulted in abandoning the year's professional development focus or in limiting the resources needed for one initiative for the sake of another. This may explain why one principal admitted she did not see a "laser-like" focus in the professional development initiatives in her school.

Considerations of limiters had no statistically significant relationship to considerations of adult learning or teacher agency, and a very moderate relationship to consideration of empirical practices.

5.3 ANALYSIS: BEST PRACTICES AND MUTUAL RESPONSIBILITY

Three ideas prompted me to conduct this study: my own experience as a teacher who dreaded professional development; Yoon et al.'s (2007) meta analytical study showing the dearth of empirical research about effective programs; and the Brookings Institute finding that the federal government annually distributes over $2.3 billion dollars through Title 1 money for professional development (Loveless, 2014). As a school leader, these three ideas made professional development for teachers seem like a well-funded, not well-used (or evaluated) tool to foster deeper learning for students, in other words, this could be low-hanging fruit. I would need to study the problem to understand why it was not well-used or evaluated.

5.3.1 Measure of professional development: student learning (not testing)

Kennedy (1998) turned the discussion of quality professional development from teachers' perceptions to student learning. The metric for student learning shifted in the following years toward standardized test scores and a benchmark met over growth gained (Garman & Holland, 2015; Gunzenhauser, 2012). With this shift, the idea of what teachers were supposed to learn also seems to have moved. Instead of learning how students learn or how to help them develop, teachers often learn content focused, strategy driven skills. This kind of professional development may align with district and school goals for achievement tests, but not cohere to goals for teachers' growth as professionals.

I wonder if using student learning—based on authentic artifacts as well as more common assessments—as the metric for successful professional development could help principals make more coherent decisions that would be anchored in the students' learning needs.

5.3.2 Missing practice: Focus on pedagogy

After delving into research informed by Yoon's (2007) study, the seven best practices at the center of this study solidified, until Garet's 2010 rebuttal highlighted the need for teacher agency in professional development. This finding matched Greene's (1997) emphasis on the teacher's own agency in the profession. It was aligned with the idea that as professionals, teachers are responsible for their own growth (Garman & Holland, 2015; TNTP, 2014) and that school leaders who foster mutual responsibility in their schools foster student learning (Gunzenhauser, 2012; Strike, 2007).

I was not sure to what degree my colleagues were aware of these best practices, how they valued teacher agency or adult learning theory, or if their limited resources would affect their choices. Their responses showed that for the most part, principals incorporated the empirically suggested best practices with one bright exception: they did not focus on helping teachers learn the way students learn.

This practice seems fundamental in considering teacher agency: if a teacher understands how students approach unfamiliar places or times, how they perceive writing orthographically, or how students incorporate number sense to create an algorithm, teachers can take that understanding and treat students with the professional perception and flexibility that each student requires to learn. Pedagogy seems vastly more important to a professional than how to use the curricular materials to help students understand concepts, yet most school leaders spent their professional development hours on the materials or related technologies. Principal 6 explained:

> I also want them to be able to leave with things for their classroom. Especially when it's during the school year, because you know they are thinking about all these things they have to do. We have a summer institute for professional

> development, and that's when we get into more philosophical things, like whole child type things, in the summer. But during the school year I look for things that are practical, that are going to engage the teachers and then impact instruction, or at least something they can take back and then use in the classroom almost immediately. We were all teachers at one point. During the school year, you are thinking about everything else you need to do. You want to be able to use it tomorrow, not use it next year.

I believe my colleague had a good point—that we need to make sure programs give teachers something they can use, but I believe that our students cannot afford for us to focus on implementing a new text series or computer application and not address pedagogy behind it. I suggest that a more focused plan for professional development can ensure the pedagogy teachers need and the curricular tools the school has chosen.

5.3.3 Connecting ideas: Empirical practice and teacher agency

Principals reported a correlative factor of $r = 0.55$ between their use of empirical practices and consideration of teacher agency. This was the only correlation in the study where one score was moderately predictive of another.

The interviews shed some light on the connection: it seemed that principals who were intentionally fostering teacher agency were also implementing empirically based strategies more often. One principal reported a very long-term approach to student writing (six or seven years), including several courses for his teachers. He also described nurturing the idea that everyone is responsible for all students' writing. Another principal described her PD planning committee that included "administrators, some teacher representatives, and upper administration. And that's

where we take a look at in-service in a year's worth of the calendar." She commented on how they work on collaborative follow up, focusing on "how do we keep coming back to it, bringing it into conversations in faculty meetings or in grade level meetings."

Intentional planning of professional development may be the lever that helped principals focus on the two aspects that Garet et al.'s (2010) study distilled. More research may be needed to understand this connection.

5.3.4 Principals not bound by limits

Principals' choices did not seem to be affected by their reported limits. A principal reported a strong use of empirically suggested practices and a positive approach to limiters, while another principal who reported using best practices reported being very hampered by limits she faced. Considerations of teacher agency and adult learning theory also varied between principals, regardless of limits. Statistically, the correlation between principals' reported limiters and empirically based practices was very weak, and was statistically insignificant for teacher agency and adult learning theory. The interviews showed the positive response in principals' creativity: teacher-led sessions, negotiated time, and budgeted allocations for programs and experts. This was a great, hopeful surprise in this study: principals are not bound by limits.

As a school leader, this finding gave me great encouragement. As a scholar, it reiterated my first drive: that we do not need to spend more money. We need to spend what we have in a different way. My colleagues are already showing their ability to do this.

5.3.5 Adult learning, teacher agency and professionalism

The tenets of adult learning theory: understanding the purpose of an initiative, being self-directing in learning, having resources available, learning life-related and problem-centered problems and having internal motivation (Knowles et al., 2011; Merriam & Bierema, 2014), all closely relate to teacher agency, but turn the lens more on how we can facilitate this teacher-directed learning.

In the survey, principals reported considering adult learning least of all practices. Part of this may be a limit of the study: this portion of the survey included only six discrete questions. Of these, principals reported only moderately aligning teacher learning to their evaluations or to student learning, occasionally allowing teachers to choose or design professional development and rarely allowing them to choose their own learning. Why not?

In the principal interviews, examples of these teacher-lead practices emerged regularly. Principals reported resources, life-related and problem-centered professional development as high priorities. Two principals reported allowing teachers to recommend programs, and only one discussed teachers being self-directed. When issues of teachers understanding the purpose of an initiative or of having internal motivation, principals seemed to take a defensive tone. One principal expressed "...and the teachers who don't want to grow, eh, that's another story." Another said, "I am not saying we're burnt out, but it's time for some new people to step up and give that energy involved in it." Another explained, "there are some veteran staff that think, 'oh, that's a free day' or a personal day, but no, you need to be there to train."

Strike (2007), Gunzenhauser (2012), Garman and Holland (2015) all urge us to move away from a standards-based accountability relationship with our teachers into an authentic, professional relationship. We are not skilled laborers following instructions. We are teachers of

the next generation. This idea of mutual responsibility makes everyone responsible for the program. Everyone is responsible for helping the students learn. Everyone is responsible for quality professional development that they understand, support and facilitate. This aligns with Heifetz's (1994) model of the leader providing direction and resources, not doing the work for the group. It addresses Labaree's (2010) observation that the teachers know better than anyone what the true need is for student learning. I suggest it is ideal to rely and facilitate the professional position of teachers.

5.4 IMPLICATIONS FOR PRACTICE

The results of this study have implications for improved practice for principals and school districts. These include fostering a climate of mutual responsibility, building programs with the goal in mind and using teacher-led teams to choose particular programs.

5.4.1 Mutual responsibility: Foster professionalism

Principals in this study regularly asked their teachers for their input and ideas, and some even had teachers on a school or district level professional development committee. Formalizing this by having teachers on a round-table committee of decision makers can offer more information about how students are learning content and about pedagogical needs teachers see first hand. Labaree (2010) pointed out that teachers are at the ground level of the educational system. They are as uniquely positioned to facilitate excellent professional development positions as principals are, only from a different perspective. Asking teachers to bear mutual responsibility for professional development decisions inculcates teacher agency and may foster the kind of

effective choices only a community of stakeholders can perceive (Garet et al., 2010; Garman & Holland, 2015; Gunzenhauser, 2012; Strike, 2007). Music, art and other non-English language arts or math teachers also may offer a helpful perspective (Greene, 1997).

5.4.2 Build the program backward from the start

One principal mentioned the backward design concept Wiggins and McTighe (1998) helped popularize. This concept could help principals and districts create programs focused enough to nurture improved instruction, leave room for district and state mandates and to weather the emergent needs. If a school built a year-long plan with a student learning goal, a means of assessing that goal, and specific scheduled instruction that met the seven empirically suggested best practices, they may have a better chance at the precise focus principals reported they missed. This plan would require more time and effort to build, but may yield more consistent results. Evaluating the plan itself could ensure continued growth in professional development for teachers (Guskey, 2002).

5.4.3 Teacher-led teams for instructional improvement

One principal mentioned a literacy committee in his school focused on how students are learning reading and writing. This team suggests professional development needs to the principal who is able to provide the targeted support teachers need. Allowing teachers to take the lead on the work they are doing on the ground can free the principal to accomplish the many other complex tasks of that role by asking teachers to take professional ownership and responsibility for their own role in student learning (Hallinger & Heck, 1996; Gunzenhauser, 2012).

5.5 IMPLICATIONS FOR POLICY

This study also has implications for district and state policy, specifically with incorporating union and teacher input, requiring a full plan from districts up front, and using streamlined accounting and grant funding to promote sharing strategies that have worked at a local level.

5.5.1 Union leaders as committee members

Union leaders may hold a contentious role beyond the scope of this study. As professionals in their district, though, their leadership can add a powerful perspective to decisions about professional development for teachers. Sharing the responsibility to help make district decisions about professional development for teachers could help foster a mutual sense of accountability for student learning across layers of the system (Labaree, 2010). Practically, it could help administrators and principals see how aspects of the plan may fit into the current bargaining agreement, or could help union representatives understand why a district administrator is pushing a certain initiative. This may help teachers invest in the program and could prevent resistance or misunderstanding that could get in the way of student learning. More importantly, this may foster mutual responsibility beyond the committee table and help unions, teachers and administrative teams work together for the sake of improved student learning (Strike, 2007).

5.5.2 Unions: professional organizations furthering professional development

It is one thing to bring union leaders and district leaders together to make decisions about professional development; it is another for a principal to nurture and lean on the professionalism

of the teachers and union in the building. I suggest that teachers' unions are well positioned to support powerful professional development programs.

The medical and legal professions expect and provide ongoing professional development for their members. The attitude of mutual accountability is not vertical, but horizontal. Perhaps teacher unions could foster this kind of professionalism by focusing on student learning and teacher growth, expecting powerful teaching and holding each other responsible it. Principals who work in this horizontal framework would be well placed to provide resources for the professional development the group needs.

5.5.3 Districts: Require full annual plan

District leaders could support effective professional development for teachers by requiring an annual professional development plan from each school (or vertical content area, or other group). This plan would include the student learning goal, the assessment measure, the scheduled specific instruction, and an evaluation measure of the plan itself. Budgeting resources around plans at the beginning of the school year would safeguard the program for the sake of student learning. Evaluating the plan would help ensure the resources were spent well according to the community's priorities.

5.5.4 Funding based on plan, teacher agency and evaluation

Educational economists offer several strategies to improve student learning. Odden and colleagues (2002) found that districts measure their spending for professional development in many different ways. Guskey (2002), Guskey (2012) and Desimore (2009) suggest that

professional development programs may benefit greatly from stronger evaluations. The New Teacher Project (2014) examines how little professional development has changed teacher practice, and suggests that monetary incentives may help budge this stubborn problem.

I suggest taking both perspectives into account. Districts and states could require professional development plans that 1) are designed and implemented by teachers and administration together, 2) use the best practices suggested by empirical studies and 3) evaluate the program for how it affects student learning. The districts and states could award grant funding to experimental designs, and could award funding for schools and districts to share effective programs with others. Districts and states may also benefit from a streamlined approach to keeping account of their funding for programs, so that they may transparently share their work with the broader community and improve student learning from the local education agency out.

5.6 IMPLICATIONS FOR FUTURE RESEARCH

The results of this study leave some threads for future research, especially in pedagogical activities, evaluation of this new design model, and evaluation of the connection of best practices and teacher agency in professional development.

5.6.1 Principal knowledge and perspective

I wondered whether principals knew about the empirically based practices supporting effective professional development at the beginning of this study. I also found a myriad of tacit assumptions in my thinking. I assumed that all principals measured student learning, not that they accepted standardized scores as a golden measure. I assumed that principals understood that

"agency" meant a locus of control for one's actions, and that teachers needed it to truly learn and grow. I thought that all my colleagues considered the tension between coherence with teacher and district goals, between standards and growth, and between playing school and deeper learning. I assumed everyone agreed with Strike (2007) and Greene (1997) and that we all sought to make our schools safe, professional, wildly creative and relational places to learn and grow.

I learned that the principals I spoke with and the colleagues who supported this study all have these aspirations to some degree, and that the understandings and perspectives were quite varied. I also was reminded of how much a doctorate can help one learn, especially when Principal 1 reminded me, "I think getting your doctorate turns you a little bit into an information troll sometimes. So you just read professionally more, and I just like to share things with them." The knowledge and perspective behind this paper were hard earned.

It may be useful to explore what kind of training principals have had that would equip them to help make decisions about professional development with teachers. Principals' knowledge of student learning and student learning measures, their consideration of the principal role, their ideas of professional organizations and mutual responsibility would help understand their mindsets. Seeing what principals know of the seven best practices in professional development and of teacher agency and adult learning theory would help understand their knowledge base. I suggest this thread left by this study may help understand principals' work and help us reconsider our practice as school leaders.

5.6.2 Pedagogical professional development

The one aspect of professional development practice not used by principals was teacher learning focused on learning how students learn specific content and how to best approach teaching

students that material. In the body of empirical research, teachers spent time learning how student learned in time-intensive, teacher-driven lessons where the university-professor-facilitator guided the learning but released responsibility for learning to the teachers (Jacobs, et al., 2007; Marek & Methven, 1991; McCutchen et al., 2002; Perry & Lewis, 2011; Saxe et al., 2001). It is not improbable that teachers can learn how students learn while in a school without university experts teaching them, but it is challenging. More research on how to practically bring understanding of student learning into a school setting may benefit professional development initiatives in the future.

5.6.3 Empirical research on this suggested program design

This study suggests designing and implementing a professional development plan for teachers that is designed: 1) by teachers and school leaders 2) with the goal first 3) with a clear assessment of student learning growth 4) with a schedule of instruction for teachers and 5) an evaluation of the program to measure its effectiveness. An empirical study may shed some initial light on the efficacy of this plan. Two similar participant groups with a common student-learning goal and assessment could be taught by teachers participating in two separate professional development plans, one designed in a traditional way and one designed by this studies parameters. The student-learning outcome of this study may provide one piece of evidence about the efficacy of this design. A qualitative analysis of both programs may provide a richer picture of how the design of professional development relates to student learning.

5.6.4 Empirically based practices and teacher agency

The strong relationship between empirically based practices and consideration of teacher agency remains unclear to the author, yet understanding it may strengthen the consideration of one or both practices. A two phase, survey-interview study focused on how principals view teacher agency may be a parallel starting place to understand this relationship. It may be that valuing teacher agency values collaboration, active engagement or other factors. It may be that valuing the professionalism of the teacher may raise expectations for content focused, coherent programs. Understanding the connection may help principals consider both aspects more clearly in decisions in the future.

5.7 CONCLUSION

This study was designed to explore how principals serving Title 1 elementary schools served by the AIU considered four factors as they made decisions about professional development for teachers. Through a survey and series of follow up interviews, principals reported the factors they consider and told the story behind those choices. Here is a summary of the results:

1. Principals tend to follow six of the seven practices for professional development suggested by empirical research. The one aspect not included is a focus on pedagogy, or how students learn specific content.
2. Principals do not tend to consider teacher agency very highly when making decisions about professional development. They do tend to listen to teachers' feedback and use surveys, but then make the decisions on their own.

3. Principals tend to consider adult learning theory even less, though they report a very high interest in active, engaged learning with information teachers can immediately use. Principals retain control over teachers' learning, sometimes failing to effectively communicate the purpose of the programs they choose, hampering teacher buy-in.
4. Principals tend to face limiters with creative, effective strategies, ensuring some measure of professional development resources for their teachers, but not always ensuring a clear focus for learning.

Districts spend money and time on professional development constantly, often without making a clear, structured plan with a student learning goal, assessment and evaluation. This strategy, along with asking teachers to partner in making professional development decisions could take a ready tool and make it sharp enough to carve a path to deeper learning for our students.

Our students need it. The standards movement over the last fifteen years has shifted our perspective away from learning and mutual responsibility toward making our students meet a benchmark and earn a score on a test. Our students need teachers who are growing and learning professionally, taking advantage of their opportunities and taking hold of their own growth. Our teachers need union members who are supporting them and encouraging them as professionals. Our schools need principals who are humbly seeking their own growth as they serve their schools and help them become places where learning is everyone's responsibility.

APPENDIX A

SURVEY: FACTORS PRINCIPALS CONSIDER WHEN MAKING DECISIONS ABOUT PROFESSIONAL DEVELOPMENT FOR TEACHERS

Table 4: Survey

The purpose of this research study is to determine what factors principals consider when making decisions about professional development for teachers. For that reason, I will be surveying principals from a number of different schools in Allegheny County and ask them to complete a brief questionnaire. If you are willing to participate, the questionnaire will ask about background (e.g. age, race, years as principal, school demographics) as well as different aspects of professional development programs you may consider when making decisions for programs for teachers. There are no foreseeable risks associated with this project, nor are there any direct benefits to you. Each participant will receive a matrix of empirically based best practices in professional development along with a summary of the outcome of the study. This is an anonymous questionnaire, so your responses will not be identifiable in any way. All responses are confidential, and results will be password protected and kept under lock and key. Your participation is voluntary, and you may withdraw from this project at any time. This study is being conducted by Kimberly Price, who can be reached at 412.908.3946, if you have any questions.
Q1 What is your gender? Male (1) Female (2) Decline to answer (3)

Table 4: Survey (continued)

Q2 What is your age? 30 years or less (1) 31-45 (2) 46-60 (3) 60 years or more (4) Decline to answer (5)
Q3 What was the last level of school that you completed? Bachelor's degree completed (1) Some graduate credits (2) Master's degree completed (3) Some credits beyond master's degree (4) Ph.D., Ed.D. completed (5) decline to answer (6)
Q4 How many years have you been employed as a principal?
Q5 How many students attend your school? Less than 300 (1) 300-700 (2) 700 or more (3) Not sure (4) Decline to answer (5)
Q6 Describe the location of your school: Inner city (1) Urban (2) Suburban (3) Small town (4) Rural (5)
Q7 What percentage of students in your school are eligible for free or reduced-cost lunch? 0-33% (1) 34-66% (2) 67% or more (3) Not sure (4) Decline to answer (5)

Table 4: Survey (continued)

Q8 What percentage of students in your school identify as non-white? 0-33% (1) 34-66% (2) 67% or more (3) Not sure (4) Decline to answer (5)
Q9 Overall, how many students at your school are performing at or above grade level in English language arts and mathematics? All (1) Most (2) Some (3) Very few (4) Not sure (5) Decline to answer (6)
Q10 In the past 12 months, approximately how many hours did teachers in your school: attend one-time professional development sessions (e.g. in person or online run by your district, school or a vendor)?
Q11 In the past 12 months, approximately how many hours did teachers in your school: participate in extended professional development programs (e.g., a focused series including multiple sessions and ongoing support)?
Q12 In the past 12 months, approximately how many hours did teachers in your school: engage in teacher-led efforts to improve instruction (e.g. researching strategies or content, testing strategies, studying student data, self reflection, etc.)?
Q13 In the past 12 months, did you facilitate teachers' participation in any of the following professional development activities? Yes (1) No (2) Activities focused on the content of the subject(s) they teach (1) University courses related to teaching (2) Observational visits to other schools (3) Workshops, conferences or training sessions led by a teacher you supervise (4)
Q14 In the past 12 months, did you facilitate any of the following? Yes (1) No (2) Allow a teacher to observe or be observed by another teacher for at least ten minutes (1) Allow a teacher to engage in individual or collaborative research on a topic of interest to the teacher professionally (2) Allow a teacher to participate in regularly scheduled collaboration with another teacher about instruction (3)

Table 4: Survey (continued)

Q15 For the professional development in which your teachers participated in the past 12 months, were you able to facilitate the following types of support? Yes (1) No (2) Reimbursement for travel and/or daily expenses (1) Full or partial reimbursement of college tuition (2) Stipend for professional development activities that took place outside of regular work hours (3) Reimbursement for conference or workshop fees (4)
Q16 In the past 12 months, how often did teachers in your school receive follow-up support to ensure they were implementing new instructional practices effectively? Always (1) Frequently (2) Sometimes (3) Rarely (4) Never (5)
Q17 Teachers in my school have time to visit each other's classrooms (e.g. to observe highly effective practice or provide feedback and support). Strongly agree (1) Agree (2) Somewhat agree (3) Disagree (4) Strongly disagree (5)
Q18 How much actual influence do teacher have in determining the content of in-service professional development programs? Considerable influence (1) Moderate influence (2) Minor influence (3) No influence (4)
Q19 I use the results from teacher evaluations to make decisions about how to provide targeted support to teachers. Strongly agree (1) Agree (2) Somewhat agree (3) Disagree (4) Strongly disagree (5)
Q20 I use the results from student assessments to make decisions about how to provide targeted support to teachers. Strongly agree (1) Agree (2) Somewhat agree (3) Disagree (4) Strongly disagree (5)

Table 4: Survey (continued)

Q21 How often is professional development for teachers at this school: Always (1) Frequently (2) Sometimes (3) Rarely (4) Never (5) Planned by teachers in the school or district? (1) Designed or chosen to support the TEACHER's improvement goals? (2) Designed or chosen to support the SCHOOL's improvement goals? (3) Designed or chosen to support the DISTRICT's improvement goals? (4) Designed or chosen to support the STATE's goals or standards? (5) Evaluated for evidence of improvement in student achievement? (6)
Q22 Please indicate your level of confidence in your ability to effectively implement the following. (For the purposes of this question, please do not consider time as a factor but rather your confidence level in carrying out these responsibilities.) Very confident (1) Confident (2) Somewhat confident (3) Not confident (4) Identifying meaningful professional development opportunities for teachers based on their specific needs or content area. (1) Developing and facilitating meaningful professional development opportunities for teachers based on their specific needs or content area. (2) Discussing student data with teachers and helping them plan instruction accordingly. (3) Following up with teachers after professional development has been conducted to assess if they are using new strategies. (4)
Q23 My school currently spends money on the kinds of professional development activities that make lasting improvements to teacher instructional practice. Strongly agree (1) Agree (2) Somewhat agree (3) Disagree (4) Strongly disagree (5)
Q24 Are the following used to provide teachers in this school with time for professional development during regular contract hours? Yes (1) No (2) Common planning time for teachers for professional development (1) Substitute teachers to cover teachers' classes (2) Early dismissal or late start for students (3) Professional development days built in before the beginning of the students' school year (4) Professional development days built in during the students' school year (5) Professional development days built in after the students' school year (6)
Q25 As a school leader, I feel supported by my district to make teacher development a top priority. Strongly agree (1) Agree (2) Somewhat agree (3) Disagree (4) Strongly disagree (5)

Table 4: Survey (continued)

Q26 My district provides me with the skills and knowledge I need to help my teachers improve their instructional practice. Strongly agree (1) Agree (2) Somewhat agree (3) Disagree (4) Strongly disagree (5)
Q27 How much control do you have in making decisions about each of the following? Considerable control (1) Some control (2) Not very much (3) No control (4) Not sure (5) Professional development for teachers (1) Budget decisions for your building (2) Teachers' schedules (3) Curriculum and instruction (4)
Q28 How much actual influence do you have on decisions concerning the following activities? Considerable influence (1) Some influence (2) Not very much (3) No influence (4) Not sure (5) Setting performance standards for students of this school (1) Developing curriculum at this school (2) Determining the content of professional development programs for teachers of this school (3)
Thank you very much for your time and help with this project. Your survey is now complete. In the next few weeks, you will receive a matrix of the aspects of professional development empirical research suggests make it effective for improving student learning. Please contact me with questions or ideas at any time. Thanks.

APPENDIX B

SURVEY QUESTIONS—ADAPTATIONS FROM LITERATURE

Table 5: Survey questions adaptations

QUESTION SOURCE	SURVEY QUESTION & METRIC	ORIGINAL QUESTION & METRIC	ADAPTATION	RATIONALE
author	Q1 What is your gender?			
	Male (1)			
	Female (2)			
	Decline to answer (3)			
author	Q2 What is your age?			
	30 years or less (1)			
	31-45 (2)			
	46-60 (3)			
	60 years or more (4)			
	Decline to answer (5)			
MetLife p 117, Q1225	Q3 What was the last level of school that you completed?	What was the last grade or level of school that you yourself completed?	I dropped some of the language that did not seem applicable.	Principals will already have a bachelor's degree. I do not think that "you yourself" is necessary language for this short survey.
	Bachelor's degree completed (1)	Two-year college graduate (Associate's Degree)	Associate's degree response omitted.	This does not apply to the participants.
	Some graduate credits (2)	Four-year college graduate (Bachelor's Degree)	I dropped the "four-year college graduate" language.	This seems unnecessary. Some bachelor's degrees can last longer. The degree is the key question, not the time.
	Master's degree completed (3)	Some graduate credits		
	Some credits beyond master's degree (4)	Master's completed	I added "degree."	This makes the metrics parallel.
	Ph.D., Ed.D. completed (5)	Credits beyond mater's	I omitted "some."	This shortened the metric language.

Table 5: Survey questions adaptations (continued)

	decline to answer (6)	Ph.D., (Ed.D) completed		
		Not sure	I omitted the "not sure" response.	Principals will likely know where they are in their own schooling. The "not sure" response may be confusing.
		Decline to answer		
author	Q4 How many years have you been employed as a principal?			
author	Q5 How many students attend your school?			
	Less than 300 (1)			
	300-700 (2)			
	700 or more (3)			
	Not sure (4)			
	Decline to answer (5)			
author	Q6 Describe the location of your school:			
	Inner city (1)			
	Urban (2)			
	Suburban (3)			
	Small town (4)			
	Rural (5)			
author	Q7 What percentage of students in your school are eligible for free or reduced-cost lunch?			
	0-33% (1)			
	34-66% (2)			
	67% or more (3)			
	Not sure (4)			
	Decline to answer (5)			
author	Q8 What percentage of students in your school identify as non-white?			
	0-33% (1)			
	34-66% (2)			
	67% or more (3)			
	Not sure (4)			
	Decline to answer (5)			
MetLife p188, Q1237	Q9 Overall, how many students at your school are performing at or above grade level in English language arts and mathematics?	Overall, how many students at your school do you think are performing at or above grade level in English language arts and mathematics?	I omitted "do you think" in the question.	This language implies perception. I am not interested in exploring the perception of the principal here, but in an objective response. To focus on this may require unnecessary time.

Table 5: Survey questions adaptations (continued)

	All (1)			
	Most (2)			
	Some (3)			
	Very few (4)			
	Not sure (5)			
	Decline to answer (6)			
TNTP p53	Q10 In the past 12 months, approximately how many hours did teachers in your school: attend one-time professional development sessions (e.g. in person or online run by your district, school or a vendor)?	Attending one-time professional development sessions or meetings (e.g., in-person or online run by your district, school, or a vendor)	I turned a "construct detail" from the TNTP survey into a question.	This adaptation clarifies the question by giving it a clear time period and clearly asking for the principal's perspective.
TNTP p53	Q11 In the past 12 months, approximately how many hours did teachers in your school: participate in extended professional development programs (e.g., a focused series including multiple sessions and ongoing support)?	Participating in extended professional development programs (e.g., a focused series including multiple sessions and ongoing support)	I turned a "construct detail" from the TNTP survey into a question.	This adaptation clarifies the question by giving it a clear time period and clearly asking for the principal's perspective.
TNTP p53	Q12 In the past 12 months, approximately how many hours did teachers in your school: engage in teacher-led efforts to improve instruction (e.g. researching strategies or content, testing strategies, studying student data, self reflection, etc.)?	Engaging in independent efforts to improve my instruction (e.g. researching strategies or content, testing strategies, studying student data, watching my practice via video, etc.)	I turned a "construct detail" from the TNTP survey into a question.	This adaptation clarifies the question by giving it a clear time period and clearly asking for the principal's perspective.
SASS TEACHER p28, Q43	Q13 In the past 12 months, did you facilitate teachers' participation in any of the following professional development activities?	In the past 12 months, did you participate in any of the following professional development activities?	I changed the language "participated" to "facilitate," and eliminated some words.	These changes focus on the principal (instead of teacher) and make the question more concise.
	Yes (1), No (2)			
SASS TEACHER p28, Q44a	Activities focused on the content of the subject(s) they teach (1)	In the past 12 months, have you participated in any professional development activities specific to and concentrating on the content of the subject(s) you teach?	I changed the language "participated" to "facilitate," and eliminated some words.	These changes focus on the principal (instead of teacher) and make the question more concise.
SASS TEACHER p28, Q43a	University courses related to teaching (2)			
SASS TEACHER p28, Q43b	Observational visits to other schools (3)			
SASS TEACHER p28, Q43c	Workshops, conferences or training sessions led by a teacher you supervise (4)	Workshops, conferences, or training sessions in which you were a presenter?	I changed "in which you were a presenter" to " lead by a teacher you supervise."	This change aligns the question to a principal perspective instead of a teacher perspective.

Table 5: Survey questions adaptations (continued)

SASS TEACHER p32, Q53	Q14 In the past 12 months, did you facilitate any of the following?	In the past 12 months, did you do any of the following?	I changed the work "do" to "facilitate."	This change aligns the question to a principal perspective instead of a teacher perspective.
	Yes (1), No (2)			
SASS TEACHER p32, Q53c	Allow a teacher to observe or be observed by another teacher for at least ten minutes (1)	Observe, or be observed by, other teachers in your classroom (for at least 10 minutes).	I added "allow a teacher to" and made the question more concise.	These changes focus on the principal (instead of teacher) and make the question more concise.
SASS TEACHER p32, Q53b	Allow a teacher to engage in individual or collaborative research on a topic of interest to the teacher professionally (2)	Engage in individual or collaborative research on a topic of interest to you professionally (2)	I added "allow a teacher to" and made the question more concise.	These changes focus on the principal (instead of teacher) and make the question more concise.
SASS TEACHER p32, Q53b	Allow a teacher to participate in regularly scheduled collaboration with another teacher about instruction (3)	Participate in regularly scheduled collaboration with another teacher about instruction (3)	I added "allow a teacher to" and made the question more concise.	These changes focus on the principal (instead of teacher) and make the question more concise.
SASS TEACHER p32, Q52	Q15 For the professional development in which your teachers participated in the past 12 months, were you able to facilitate the following types of support?	For the professional development in which you participated in the past 12 months, did you receive the following types of support?	I changed "you" to "your teachers," and changed "receive" to "facilitate."	This change aligns the question to a principal perspective instead of a teacher perspective.
	Yes (1), No (2)			
SASS TEACHER p32, Q52f	Reimbursement for travel and/or daily expenses (1)			
SASS TEACHER p32, Q52d	Full or partial reimbursement of college tuition (2)			
SASS TEACHER p32, Q52c	Stipend for professional development activities that took place outside of regular work hours (3)	Stipend for professional development activities that took place outside of regular work hours (3)	I added the word "of."	This seems clearer.
SASS TEACHER p32, Q52e	Reimbursement for conference or workshop fees (4)			
TNTP p53	Q16 In the past 12 months, how often did teachers in your school receive follow-up support to ensure they were implementing new instructional practices effectively?	Receive follow up support to ensure I am implementing new instructional practices effectively.	I added "in the past 12 months," and shifted "I" to "teachers."	This adaptation clarifies the question by giving it a clear time period and clearly asking for the principal's perspective.
	Always (1)	Not in original metric	I added "always."	This answer suggests a culture of consistent support, and is focused on the principal's perspective of the kind of follow up in the building.

Table 5: Survey questions adaptations (continued)

	Frequently (2)	Often	I changed "frequently" to "often."	Frequently implies a number of times; often implies a culture or way of going about things. This question is designed to measure the principal's perception of the latter.
	Sometimes (3)			
	Rarely (4)			
	Never (5)			
TNTP p56	Q17 Teachers in my school have time to visit each other's classrooms (e.g. to observe highly effective practice or provide feedback and support).	This question was part of the data construct listed under the "School Support Structure (Index)." No changes were made.		
	Strongly agree (1)			
	Agree (2)			
	Somewhat agree (3)	This question included a "somewhat disagree" category. It was eliminated.		This omission helps keep the metric to five or less, simplifying the tool.
	Disagree (4)			
SASS TEACHER p35, Q61c	Q18 How much actual influence do teachers have in determining the content of in-service professional development programs?	How much actual influence do you think teachers have over school policy AT THIS SCHOOL in each of the following areas? Determining the content of in-service professional development programs.	I eliminated "do you think," "school policy," and "at this school."	These three phrases seemed unnecessary.
	Considerable influence (1)	A great deal of influence.	I changed "a great deal" to "considerable."	This language may be more clearer.
	Moderate influence (2)	N.B.: the flow of the metric was negative to positive in the survey.	I changed the flow from positive to negative.	This structure parallels similar questions in the survey.
	Minor influence (3)			
	No influence (4)			
TNTP p55	Q19 I use the results from teacher evaluations to make decisions about how to provide targeted support to teachers.	My school uses the results from teacher evaluations to make decisions about how to provide targeted support to teachers.	I changed "my school" to "I."	This change asks the question about a principal's perspective.
	Strongly agree (1)			
	Agree (2)			
	Somewhat agree (3)	This question included a "somewhat disagree" category. It was eliminated.		This omission helps keep the metric to five or less, simplifying the tool. It creates a median response.
	Disagree (4)			
	Strongly disagree (5)			

Table 5: Survey questions adaptations (continued)

TNTP p55	Q20 I use the results from student assessments to make decisions about how to provide targeted support to teachers.	My school uses the results of student assessments to make decisions about how to provide targeted support to teachers.	I changed "my school" to "I."	This change asks the question about a principal's perspective.
	Strongly agree (1)			
	Agree (2)			
	Somewhat agree (3)	This question included a "somewhat disagree" category. It was eliminated.		This omission helps keep the metric to five or less, simplifying the tool. It creates a median response.
	Disagree (4)			
	Strongly disagree (5)			
SASS PRINCIPAL p11 Q19	Q21 How often is professional development for teachers at this school:			
	Always (1) Frequently (2) Sometimes (3) Rarely (4) Never (5)	N.B.: the flow of the metric was negative to positive in the survey.		
SASS PRINCIPAL p11 Q19f	Planned by teachers in the school or district? (1)			
author	Designed or chosen to support the TEACHER's improvement goals? (2)			
SASS PRINCIPAL p11 Q19a	Designed or chosen to support the SCHOOL's improvement goals? (3)			
SASS PRINCIPAL p11 Q19b	Designed or chosen to support the DISTRICT's improvement goals? (4)			
SASS PRINCIPAL p11 Q19c	Designed or chosen to support the STATE's goals or standards? (5)			
SASS PRINCIPAL p11 Q19d	Evaluated for evidence of improvement in student achievement? (6)			
TNTP p57	Q22 Please indicate your level of confidence in your ability to effectively implement the following. (For the purposes of this question, please do not consider time as a factor but rather your confidence level in carrying out these responsibilities.)	This question was part of the data construct listed under the "School Leader Confidence." No changes were made.		
	Very confident (1) Confident (2) Somewhat confident (3) Not confident (4)	This question included a "not very confident" and "not at all confident" category. They were eliminated.		This omission helps keep the metric to five or less, simplifying the tool.

Table 5: Survey questions adaptations (continued)

	Identifying meaningful professional development opportunities for teachers based on their specific needs or content area. (1)			
	Developing and facilitating meaningful professional development opportunities for teachers based on their specific needs or content area. (2)			
	Discussing student data with teachers and helping them plan instruction accordingly. (3)			
	Following up with teachers after professional development has been conducted to assess if they are using new strategies. (4)			
TNTP p57	Q23 My school currently spends money on the kinds of professional development activities that make lasting improvements to teacher instructional practice.			
	Strongly agree (1)			
	Agree (2)			
	Somewhat agree (3)	This question included a "somewhat disagree" category. It was eliminated.		This omission helps keep the metric to five or less, simplifying the tool. It creates a median response framed in positive language.
	Disagree (4)			
	Strongly disagree (5)			
SASS PRINCIPAL p10 Q18	Q24 Are the following used to provide teachers in this school with time for professional development during regular contract hours?			
	Yes (1), No (2)			
SASS PRINCIPAL p10 Q18f	Common planning time for teachers for professional development (1)			
SASS PRINCIPAL p10 Q18a	Substitute teachers to cover teachers' classes (2)			
SASS PRINCIPAL p10 Q18b	Early dismissal or late start for students (3)			

Table 5: Survey questions adaptations (continued)

SASS PRINCIPAL p10 Q18c	Professional development days built in before the beginning of the students' school year (4)			
SASS PRINCIPAL p10 Q18d	Professional development days built in during the students' school year (5)			
SASS PRINCIPAL p10 Q18e	Professional development days built in after the students' school year (6)			
TNTP p57	Q25 As a school leader, I feel supported by my district to make teacher development a top priority.	I feel supported by my district to prioritize teacher development as one of my main areas of focus as a school leader.	I added "as a school leader" and made the sentence more concise.	This seems clearer.
	Strongly agree (1)			
	Agree (2)			
	Somewhat agree (3)	This question included a "somewhat disagree" category. It was eliminated.		This omission helps keep the metric to five or less, simplifying the tool. It creates a median response framed in positive language.
	Disagree (4)			
	Strongly disagree (5)			
TNTP p57	Q26 My district provides me with the skills and knowledge I need to help my teachers improve their instructional practice.			
	Strongly agree (1)			
	Agree (2)			
	Somewhat agree (3)	This question included a "somewhat disagree" category. It was eliminated.		This omission helps keep the metric to five or less, simplifying the tool.
	Disagree (4)			
	Strongly disagree (5)			
author	Q27 How much control do you have in making decisions about each of the following?			
	Considerable control (1) Some control (2) Not very much (3) No control (4) Not sure (5)			
	Professional development for teachers (1)			
	Budget decisions for your building (2)			
	Teachers' schedules (3)			
	Curriculum and instruction (4)			

Table 5: Survey questions adaptations (continued)

SASS PRINCIPAL p9, Q16	Q28 How much actual influence do you have on decisions concerning the following activities?	How much actual influence do you think you have as a principal on decisions concerning the following activities?	I omitted "do you think" and "as a principal" in the question.	These two phrases seemed unnecessary.
	Considerable influence (1) Some influence (2) Not very much (3) No influence (4) Not sure (5)	No influence; minor influence; moderate influence; major influence; not applicable	I changed the language and the flow of the metrics.	This change made the metrics parallel other metrics in the survey.
SASS PRINCIPAL p9, Q16a	Setting performance standards for students of this school (1)			
author	Developing curriculum at this school (2)			
SASS PRINCIPAL p9, Q16c	Determining the content of professional development programs for teachers of this school (3)	Determining the content of in-service professional development programs for teachers of this school	I omitted "in-service."	The phrase seemed unnecessary.

APPENDIX C

SURVEY QUESTIONS & RESEARCH QUESTIONS

Table 6: Survey questions and research questions

NUMBER OF QUESTION	QUESTION	What characteristics of empirical evidence do principals consider when making decisions about professional development for teachers?	EMPIRICAL ASPECT	What characteristics of teacher agency do principals consider when making decisions about professional development for teachers?	ASPECT OF AGENCY	What characteristics of adult learning do principals consider when making decisions about professional development for teachers?	ASPECT OF ADULT LEARNING	What limiters to principals consider when making decisions about professional development for teachers?	SPECIFIC LIMIT
Q1	What is your gender?								
Q2	What is your age?								
Q3	What was the last level of school that you completed?								
Q4	Altogether, how many years have you worked as a principal?								
Q5	How many students attend your school?								
Q6	Describe the location of your school:								
Q7	What percentage of students in your school are eligible for free or reduced-cost lunch?								
Q8	What percentage of students in your school identify as non-white?								

Table 6: Survey questions and research questions (continued)

Q9	Overall, how many students at your school are performing at or above grade level in English language arts and mathematics?								
Q10	In the past 12 months, approximately how many hours did teachers in your school: attend one-time professional development sessions (e.g. in person or online run by your district, school or a vendor)?	X	time						
Q11	In the past 12 months, approximately how many hours did teachers in your school: participate in extended professional development programs (e.g., a focused series including multiple sessions and ongoing support)?)	X	duration						
Q12	In the past 12 months, approximately how many hours did teachers in your school: engage in teacher-led efforts to improve instruction (e.g. researching strategies or content, testing strategies, studying student data, self reflection, etc.)?	X	time	X	teacher initiation	X	self-concept, orientation		
Q13.1	In the past 12 months, did you facilitate teachers' participation in any of the following professional development activities? Activities focused on the content of the subject(s) they teach	X	focus on content			X			
Q13.2	In the past 12 months, did you facilitate teachers' participation in any of the following professional development activities? University course(s) related to teaching?	X	engagement	X		X	readiness, motivation, orientation		
Q13.3	In the past 12 months, did you facilitate teachers' participation in any of the following professional development activities? Observational visits to other schools?	X	collaboration	X	peer engagement	X	readiness, motivation, orientation		
Q13.4	In the past 12 months, did you facilitate teachers' participation in any of the following professional development activities Workshops, conferences or training sessions led by a teacher you supervise	X	engagement	X	teacher leadership	X	why, self-concept, readiness, resources, motivation, orientation	X	principal decision making power
Q14.1	In the past 12 months, did you facilitate any of the following? Allow a teacher to observe or be observed by another teacher for at least ten minutes	X	collaboration	X	peer engagement	X	orientation		

Table 6: Survey questions and research questions (continued)

Q14.2	In the past 12 months, did you facilitate any of the following? Allow teacher to engage in individual or collaborative research on a topic of interest to the teacher professionally	X	engagement	X	teacher choice	X	motivation, orientation		
Q14.3	In the past 12 months, did you facilitate any of the following? Allow a teacher to participate in regularly scheduled collaboration with another teacher about instruction	X	collaboration, pedagogy			X	readiness, orientation		
Q15.1	For the professional development in which your teachers participated in the past 12 months, were you able to facilitate the following types of support? Reimbursement for travel and/or daily expenses							X	principal decision making power, finances
Q15.2	For the professional development in which your teachers participated in the past 12 months, were you able to facilitate the following types of support? Full or partial reimbursement of college tuition	X	engagement	X	teacher choice	X	readiness, motivation, orientation	X	principal decision making power
Q15.3	For the professional development in which you participated in the past 12 months, were you able to provide the following types of support? Stipend for professional development activities that took place outside regular work hours					X	self-concept, motivation, orientation	X	finances, principal decision making power
Q15.4	For the professional development in which your teachers participated in the past 12 months, were you able to facilitate the following types of support? Reimbursement for conference or workshop fees							X	finances
Q16	In the past 12 months, how often did teachers in your school receive follow-up support to ensure they were implementing new instructional practices effectively?	X	engagement, duration			X	readiness, motivation, orientation		
Q17	Teachers in my school have time to visit each other's classrooms (e.g., to observe highly effecdtive practice or provide feedback and support).	X	collaboration	X	teacher initiation	X	readiness, orientation	X	time
Q18	How much actual influence do teachers have in determining the content of in-service professional development programs?			X	teacher choice, teacher leadership				

Table 6: Survey questions and research questions (continued)

Q19	I use the results from teacher evaluations to make decisions about how to provide targeted support to teachers.	X	coherent: school goals			X	orientation		
Q20	I use the results of student assessments to make decisions about how to provide targeted support to teachers	X	coherent: school goals			X	orientation		
Q21.1	How often is professional development for teachers at this school-- Planned by teachers in theschool or district?	X	engagement	X	teacher leadership	X	why, self-concept, readiness, resources, motivation, orientation		
Q21.2	How often is professional development for teachers at this school-- Designed or chosen to support the TEACHER's improvement goals?			X	teacher choice, teacher leadership	X	readiness, motivation, orientation		
Q21.3	How often is professional development for teachers at this school-- Designed or chosen to support the SCHOOL's improvement goals?	X	coherent: school goals						
Q21.4	How often is professional development for teachers at this school-- Designed or chosen to support the DISTRICT's improvement goals?	X	coherent: school goals						
Q21.5	How often is professional development for teachers at this school-- Designed or chosen to support the STATE's goals or standards?	X	coherent: school goals						
Q21.6	How often is professional development for teachers at this school-- Evaluated for evidence of improvement in student achievement?	X	empirical evaluation					X	empirical evidence based evaluation
Q22.1	Please indicate your level of confidence in your ability to effectively implement the following. (For the purposes of this question, please do not consider time as a factor but rather your confidence level in carrying out these responsibilities.) Identifying meaningful professional development opportunities for teachers based on their specific needs or content area.	X	coherent: teacher needs, content			X	readiness, motivation, orientation	X	principal decision making power

Table 6: Survey questions and research questions (continued)

Q22.2	Please indicate your level of confidence in your ability to effectively implement the following. (For the purposes of this question, please do note consider time as a factor but rather your confidence level in carryingout these responsibilities.) Developing and facilitating meaningful professional develpoment opportunities for teachers based on their specific needs or content area.	X	coherent: teacher needs, content			X	readiness, motivation, orientation	X	principal decision making power
Q22.3	Please indicate your level of confidence in your ability to effectively implement the following. (For the purposes of this question, please do note consider time as a factor but rather your confidence level in carryingout these responsibilities.) Discussing student data with teachers and helping them plan accordingly.	X	coherent: teacher needs, content			X	readiness, motivation, orientation	X	principal decision making power
Q22.4	Please indicate your level of confidence in your ability to effectively implement the following. (For the purposes of this question, please do note consider time as a factor but rather your confidence level in carryingout these responsibilities.) Following up with teachers after professional develpment has been conducted to assess if they are using new strategies.	X	engagement, duration			X	readiness, motivation, orientation	X	principal decision making power
Q23	My school currently spends money on the kinds of professional develoment activities that make lasting improvements to teacher instructional practice.							X	finances
Q24.1	Are the following used to provide teachers in this school with time for professional development during regular contract hours? Common planning time for teachers for professional development	X	collaboration			X	readiness, orientation	X	scheduling (time)
Q24.2	Are the following used to provide teachers in this school with time for professional development during regular contract hours? Substitute teachers to cover teachers' classes							X	principal decision making power, finances, time

Table 6: Survey questions and research questions (continued)

Q24.3	Are the following used to provide teachers in this school with time for professional development during regular contract hours? Early dismissal or late start for students							X	time
Q24.4	Are the following used to provide teachers in this school with time for professional development during regular contract hours? Professional days built in before the beginning of the students' school year							X	time
Q24.5	Are the following used to provide teachers in this school with time for professional development during regular contract hours? Professional days built in during the students' school year							X	time
Q24.6	Are the following used to provide teachers in this school with time for professional development during regular contract hours? Professional days built in after the students' school year							X	time
Q25	As a school leader, I feel supported by my district to make teacher development a top priority.					X		X	principal decision making power, district support
Q26	My district provides me with the skills and knowledge I need to help my teachers improve their instructional practice.					X		X	principal decision making power, district support
Q27.1	How much control do you have in making decisions about each of the following? Professional development for teachers							X	principal decision making power
Q27.2	How much control do you have in making decisions about each of the following? Budget decisions for your building							X	finances
Q27.3	How much control do you have in making decisions about each of the following? Teachers' schedules							X	time
Q27.4	How much control do you have in making decisions about each of the following? Curriculum and instruction							X	content

Table 6: Survey questions and research questions (continued)

Q28.1	How much actual influence do you have on decisions concerning the following activities? Setting performance standards for students of this school							X	principal decision making power
Q28.2	How much actual influence do you have on decisions concerning the following activities? Developing curriculum at this school							X	principal decision making power
Q28.3	How much actual influence do you have on decisions concerning the following activities? Determining the content of professional development programs for teachers of this school							X	principal decision making power, content

APPENDIX D

SURVEY LETTER

Dear Colleague:

As a principal in one of the AIU's Title I elementary schools, you have a unique perspective on the programs, resources and barriers that you take into account when facilitating professional development for teachers. I am deeply interested in that perspective.

I am Kim Price, a doctoral student at the University of Pittsburgh and an assistant principal at Highlands High School. I am completing a dissertation study exploring how we make these choices for our teachers. Would you be willing to take a moment and share your experiences?

Please use the link below to take you to a brief survey. Take a few moments to answer the questions between now and November 30th. Your answers will remain confidential. I will analyze the results include the aggregate data into the study.

At the conclusion of the study, I will share with you a summary of the results, and a matrix of factors that empirical research suggests are best practices in professional development for teachers. Thank you in advance for sharing your thoughts.

Sincerely,

Kim Price

Kimberly Price
Ninth & Tenth Grade
Assistant Principal
Highlands High School
724.226.1000
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APPENDIX E

INTERVIEW GUIDE

Table 7: Interview guide

#	QUESTION
1	I am interested in learning about how principals make decisions for professional development for teachers. Please tell me about your background as a principal, first.
2	What role do you play in making decisions about professional development for teachers?
3	What characteristics do you consider to be first priority when choosing programs? Second priority? Third priority?
4	What characteristics of professional development are non-negotiables for you?
5	Consider a time when you had to make a concession in your decision. For example, you may have had money to pay for a one-day training delivered by an expert, but none for follow up, etc.. How did you make the decisions for P.D. in that situation?
6	What do you consider the biggest barrier to facilitating the highest quality professional development?
7	How have you faced that roadblock?
8	What role does teacher voice play into your decisions?
9	How do you balance state and district goals for the school with your individual teacher goals for their own professional growth?
10	How do you know a professional development program has been effective?

APPENDIX F

REGRESSION ANALYSIS TABLES

Table 8: Regression analysis tables

EMPIRICAL PRACTICES & TEACHER AGENCY

RESIDUAL OUTPUT

Observation	*Predicted Teacher Agency Ave*	*Residuals*
1	3.906621519	-1.706621519
2	3.675588434	-0.475588434
3	3.59265348	0.80734652
4	2.905478149	0.894521851
5	3.983632548	0.766367452
6	3.924393295	0.575606705
7	3.752599462	-0.552599462
8	3.675588434	0.324411566
9	3.675588434	0.124411566
10	3.260913665	0.539086335
11	3.444555348	0.155444652
12	4.445698719	0.354301281
13	4.060643576	-0.660643576
14	3.059500206	-0.459500206
15	2.82846712	-0.42846712
16	3.752599462	0.247400538
17	2.905478149	-0.505478149

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.553421759
R Square	0.306275644
Adj. R Square	0.260027353
Standard Error	0.708220525
Observations	17

EMPIRICAL PRACTICES & ADULT LEARNING

RESIDUAL OUTPUT

Observation	*Predicted Adult Learning Ave*	*Residuals*
1	3.604894366	-0.204894366
2	3.512833701	-0.512833701
3	3.479786282	0.120213718
4	3.205964818	0.194035182
5	3.635581254	0.031085413
6	3.611975955	-0.211975955
7	3.543520589	-0.343520589
8	3.512833701	-0.512833701
9	3.512833701	-0.112833701
10	3.34759661	-0.34759661
11	3.420773036	-0.620773036
12	3.819702584	0.980297416
13	3.666268142	-0.066268142
14	3.267338594	0.732661406
15	3.175277929	0.024722071
16	3.543520589	0.456479411
17	3.205964818	0.394035182

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.377718139
R Square	0.142670993
Adj R Square	0.085515726
Standard Error	0.459660425
Observations	17

TEACHER AGENCY & ADULT LEARNING THEORY

RESIDUAL OUTPUT

Observation	*Predicted Teacher Agency Ave*	*Residuals*
1	3.543681047	-1.343681047
2	3.351863508	-0.151863508
3	3.639589816	0.760410184
4	3.543681047	0.256318953
5	3.671559406	1.078440594
6	3.543681047	0.956318953
7	3.447772277	-0.247772277
8	3.351863508	0.648136492

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.279973316
R Square	0.078385058
Adj. R Square	0.016944061
Standard Error	0.81629999
Observations	17

EMPIRICAL PRACTICES & LIMITERS

RESIDUAL OUTPUT

Observation	*Predicted Empirical Ave*	*Residuals*
1	4.010499457	0.203786257
2	3.847967676	0.152032324
3	3.859577089	0.063499834
4	3.871186502	-0.585472216
5	3.952452393	0.333261893
6	3.859577089	0.371192142
7	3.929233567	0.142195005
8	3.929233567	0.070766433

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.232503193
R Square	0.054057735
Adj. R Square	-0.009005083
Standard Error	0.424504819
Observations	17

Table 8: Regression analysis tables (continued)

9	3.543681047	0.256318953		3.871186502	0.128813498
10	3.351863508	0.448136492		4.173031239	-0.557646624
11	3.255954738	0.344045262		3.731873546	0.053840739
12	4.215042433	0.584957567		3.964061806	0.750223909
13	3.639589816	-0.239589816		3.998890044	0.358252813
14	3.831407355	-1.231407355		3.778311198	-0.34973977
15	3.447772277	-1.047772277		3.882795915	-0.668510201
16	3.831407355	0.168592645		3.906014741	0.165413831
17	3.639589816	-1.239589816		3.917624154	-0.631909868

TEACHER AGENCY & LIMITERS					**LIMITERS & ADULT LEARNING**			
RESIDUAL OUTPUT			SUMMARY OUTPUT		RESIDUAL OUTPUT		SUMMARY OUTPUT	
Observation	*Predicted Teacher Agency Ave*	*Residuals*	*Regression Statistics*		*Predicted Empirical Ave*	*Residuals*	*Regression Statistics*	
1	3.634443646	-1.434443646	Multiple R	0.065872532	4.010499457	0.203786257	Multiple R	0.045245581
2	3.544734141	-0.344734141	R Square	0.00433919	3.847967676	0.152032324	R Square	0.002047163
3	3.551141963	0.848858037	Adj. R Square	-0.062038197	3.859577089	0.063499834	Adj. R Square	-0.064483027
4	3.557549784	0.242450216	Standard Error	0.848458772	3.871186502	-0.585472216	Standard Error	0.495927697
5	3.602404537	1.147595463	Observations	17	3.952452393	0.333261893	Observations	17
6	3.551141963	0.948858037			3.859577089	0.371192142		
7	3.589588893	-0.389588893			3.929233567	0.142195005		
8	3.589588893	0.410411107			3.929233567	0.070766433		
9	3.557549784	0.242450216			3.871186502	0.128813498		
10	3.724153151	0.075846849			4.173031239	-0.557646624		
11	3.480655923	0.119344077			3.731873546	0.053840739		
12	3.608812359	1.191187641			3.964061806	0.750223909		
13	3.628035824	-0.228035824			3.998890044	0.358252813		
14	3.50628721	-0.90628721			3.778311198	-0.34973977		
15	3.563957606	-1.163957606			3.882795915	-0.668510201		
16	3.57677325	0.42322675			3.906014741	0.165413831		
17	3.583181072	-1.183181072			3.917624154	-0.631909868		

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